AN ANALYSIS OF SELECTED DEVELOPMENT PROGRAMMES FOR PROMOTING COCONUT PRODUCTION IN KERALA

BY

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THESIS

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DECLARATION

I hereby declare that this thesis entitled "AN ANALYSIS OF SELECTED DEVELOPMENT PROGRAMMES FOR PROMOTING COCONUT PRODUCTION IN KERALA" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title of any other University or Society.

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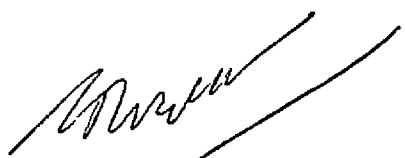
CERTIFICATE

Certified that this thesis, entitled "AN ANALYSIS OF SELECTED DEVELOPMENT PROGRAMMES FOR PROMOTING COCONUT PRODUCTION IN KERALA", is a record of research work done independently by Shri R. Jnanadevan under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to him.



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INTRODUCTION

1.INTRODUCTION

The coconut palm, one of the traditional tree crops grown in India, has a recorded history of over 3000 years. The crop is now grown in an area of about 1.5 million hectares with an annual production of 9700 million nuts (1990-91 estimate). In terms of area and production, India is the third largest coconut growing country in the world. Coconut is valued both as an oilseed crop and food crop. Among the oilseed crops presently grown in the country, coconut has the highest oil yield per unit area and is also known for its consistency in production. With an oil yield up to 65 per cent of copra, the dried kernel of coconut, is perhaps, the richest source of vegetable oil in the country.

Among the coconut growing states in India, Kerala ranks first both in area and production of coconut. The State accounts for 50 per cent of the total area under coconut in the country and 47 per cent of the total production. Presently, coconut is cultivated in the State in an area of 8.70 lakh hectares with an annual production of 4332 million nuts (Farm Guide 1993). However, it is paradoxical to note that the average yield of the crop in the State is only 32 nuts per palm per year as against 43 nuts in Tamil Nadu and 55 nuts in Karnataka. (Muliar, 1989).

The major reasons identified for the low productivity of coconut in Kerala are the rainfed nature of the crop with only less than 10 per cent of the area under occasional irrigation, failure of replanting and new planting programmes to keep pace with the increase in proportion of senile and unproductive palms in each holding, extensive damage caused by the widespread prevalence of root (wilt) disease and inadequate management, particularly with respect to regular replenishment of soil organic matter.

To overcome these constraints and boost up the production and productivity of the crop, a number of development programmes have been chalked out and implemented in the State by the State Department of Agriculture and Coconut Developement Board. New planting with high yielding varieties, adoption of recommended package of practices, rehabilitation of diseased and senile coconut gardens and expanding irrigation facilities are the major thrust areas covered by the development programmes of the Coconut Development Board.

Over a period of years a number of development projects were implemented in Kerala for achieving significant increase in area and production of coconut. Area expansion programme implemented by the Coconut Development Board was one such programme which provided the farmers with financial and

technical assistance for taking up new planting. The other major programmes undertaken by the Board were (1) Promoting irrigation facilities in coconut gardens by extending financial assistance to farmers for the installation of pumpsets and (2) Integrated farming for the development of coconut small holdings for productivity improvement.

Need for the Study

It is not precisely known whether the technical and financial assistance provided to farmers under various development programmes was effective in bringing about the desired changes in the farming practices adopted by the beneficiaries. To what extent the programmes undertaken by the Board could motivate the farmers in adopting the recommended practices and influence the production of coconut in their fields is also not clearly understood. An objective study in this direction will bring to limelight the positive and negative features of programme formulation and implementation. The results of such a study will provide adequate information for promoting new programmes in the future besides strengthening the ongoing ones for achieving the desired objectives.

Few comprehensive studies were conducted in the past to assess the effectiveness of coconut development programmes.

Hence, this study was taken up to analyse three selected coconut development programmes, viz., Area expansion programme, Programme for providing assistance for Irrigation facilities in coconut gardens and Integrated Farming Programme for the Coconut Small Holdings for Productivity Improvement, implemented by the Coconut Development Board.

The specific objectives of the study were:

a. To study the awareness about and attitude of coconut growers towards coconut development programmes undertaken in the State.

b. To study the knowledge and extent of adoption of recommended farming practices under each programme by beneficiaries and non-beneficiaries.

c. To identify constraints, if any, in the adoption of recommended technologies under the development programmes as perceived by the farmers.

d. Identification of constraints as perceived by Agricultural Officers responsible for the implementation of coconut development programmes.

Limitations of the study

Since coconut growers are distributed over the entire State, the coconut development programmes have been implemented in almost all districts covering a large number of farmers. Considering the limited time and other resources available at the disposal of the investigator, only three major coconut development programmes promoted by the Coconut Development Board and implemented through the Department of Agriculture were taken up for the present study. Though the beneficiaries of the programmes were spread over the entire State, the maximum concentration was in Alapuzha district. As such, the present study was restricted to the farmers in the Alapuzha District. As only one district was covered by the present study, the results may not be equally applicable to other districts and other crops. Despite these limitations, it is expected that the findings would provide adequate insight into the concept of the ongoing programmes which would be of help in the formulation of projects and their implementation in the future.

THEORETICAL ORIENTATION

2.THEORETICAL ORIENTATION

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

Keeping in view of the specific objectives of the study, this chapter is presented as follows:

2.1. Concept of development.

2.2. Concept of agricultural development programmes.

2.3. Coconut development programmes.

2.4. Dependent variables of the study.

2.5 Independent variables and their relationship with dependent variables.

2.6. Constraints involved in the implementation of the programme and adoption of improved scientific practices.

2.7. Theoretical concept and operational definitions of the selected variables.

2.8. Hypothesis set for study.

2.1. Concept of Development

Development implies gradual and sequential phases of change. Rogers and Shoemaker (1970) defined development as a type of social change in which new ideas are introduced into the social system in order to produce higher per-capita income and levels of living through modern production methods and improved social organisations.

World development report (1991) defined economic development as a sustainable increase in living standards that encompasses material consumption, education, health and environmental protection. Development in broader sense is understood to include other important and related attributes as well, notably more equality of opportunity and political freedom and liberties. The overall goal of development is, therefore, to increase the economic, political and civil rights of all people across gender, ethnic groups, races, religions and countries.

2.1.2 Agricultural Development

Shankariah and Reithmuller (1977) reported agricultural development as an outcome of developing peoples' ability to set up goals, make decisions and carry out their plans.

According to Alexander (1982) agricultural development would lead to

(1) Transformation of subsistence agriculture to commercial agriculture.

(2) Increase in commercial activities.

(3) Increase in division of labour in agriculture.

(4) Transformation of occupational structure and

(5) Modernisation of beliefs and values.

Agricultural development can be considered as development that occurs in the sphere of agriculture. It can be referred to as the considerable increase in the productivity of crops resulting from modern technology, which in turn will shape meticulously the socio-economic conditions of farmers.

In the context of coconut development programme agricultural development can be defined as improvement in productivity of

coconut palms and thereby enhancing the economic status of farmers, especially small holders.

2.2. Agricultural Development Programmes

Agricultural development programmes are meant to meet the needs of the farmer. Arrangements for the production and supply of improved seeds, particularly of high yielding varieties (HYV) have been strengthened. Efforts are being made to lessen the gap between the research centre and the field. The supply of inputs and institutional credit for agricultural requirements are being constantly stepped up. Many such programmes also aim at the upliftment of the weaker sections, the small and marginal farmers.

Therefore, the coconut development programmes, selected for this study, give emphasis to meet the need of the coconut growers. The programmes ensure increased production through timely supply of inputs, such as, high yielding variety seedlings, fertilizers, plant protection chemicals etc.

2.3. Coconut Development Programmes

There are many programmes implemented in Kerala in order to promote cultivation and production of coconut, of which,

three development programmes were selected for this study. They are Area expansion programme, Programme for promotion of irrigation facilities in coconut gardens and Integrated farming in coconut small holdings for productivity improvement (Coconut Development Board, 1992).

2.3.1. Area expansion programe: The objective of this programme is to provide adequate technical and financial support to the farmers to attain a significant achievement in extending the area under coconut. This programme is implemented in all districts of Kerala by the Coconut Development Board through the Department of Agriculture since 1982-83, for expanding the area under coconut. Technical guidance and a subsidy of Rs. 3000/- per ha. is provided to small and marginal farmers who undertake new planting in an area of not less than 0.1 ha.subject to a maximum of 2 ha. With the implimentation of the programme during the decade, 1982-92, an additional area of 12337 ha. could be brought under new planting of coconut by providing financial incentives to the tune of Rs. 1.90 crores. About 27000 farmers in the state benifited by availing themselves of the subsidy (Gopalakrishnan, 1992).

2.3.2. Scheme for providing assistance for developing irrigation facilities in coconut holdings: Irrigation has been identified as the most important factor which would help to achieve significant improvement in productivity of coconut with in a short period. In order to prevent the ill effects of periodic droughts experienced in coconut gardens and to develop permanent measures for sustaining the productivity at higher level the scheme being implemented in all districts of Kerala through the Department of Agriculture since 1984-85 with 50 per cent financial assistance from Coconut Development Board. Under this programme subsidy will be extended to the farmers for installation of irrigation pumpsets at the rate of 25 percent of the total cost of pumpset, or Rs. 1000/- whichever is less. During the period from 1984-85 to 1991-92, 5354 pumpsets have been installed in the coconut gardens for irrigation by availing subsidy and other programme. (Coconut Development Board, 1989 - 1992)

2.3.3. Integrated farming in coconut small holdings of Kerala for productivity improvement : The main objective of this scheme is to convert the uneconomic monocropped coconut holdings in to economically viable ones through an integrated approach consisting of removal of diseased/senile coconut palm, replanting with quality seedlings, development

of irrigation sources, intensive use of fertilizers, promotion of inter/mixed cropping etc. The Scheme is implemented by the State Government in selected areas with 50 percent financial participation of the board since 1987-88. During the period from 1987-88 to 1991-92, a total area of 30,000 ha. has been covered under the programme in sixty selected units of 500 ha. each. (Coconut Development Board, 1988-1992).

2.4 Dependant Variables

2.4.1. Awareness: Any development programme aimed at the welfare of the people, calls for maximum people's participation. The success of the development programme lies in the support given by the masses. So, to gain support prime step is to make the people aware of the programme, its activities, aim etc. Awareness is the first step towards adoption.

Lionberger (1960) defined awareness as the first knowledge about a new idea, product or practice. At the awareness stage a person has only general information about it.

2.4.1.1. Awareness about development programmes: A brief review of some of the studies on similar development programmes is presented below:

Muthuraj (1979) observed that the user small farmer possessed greater awareness about the organisation that would hire out farm machinery, hire charges levied and incentives offered than non-user small farmer. He also observed that user and non-user marginal farmers differed significantly in their awareness.

Balu (1980) found that three fourth of the participants (71.67%) and nearly half of the non participants (40 %) belong to medium awareness category about the functioning of Integrated Dry Land Agricultural Development Programmes. He further added that 13.33 percent of the participants were having higher awareness level while only 1.67 percent of non participants were at lower stage of awareness.

Haraprasad (1982) found that the beneficiaries had significantly higher awareness about Small Farmers Development Agency (SFDA) activities than non-beneficiaries.

Ponnappan (1982) found that fish farmers had significantly higher awareness about facilities of Fish farmers development programmes than others.

Krishnankutty (1988) in her study on the Integrated rural development programme, reported that majority of

respondents had medium level of awareness about the programmes, low awareness about the benefits of the scheme and all beneficiaries had low or medium level of awareness about the implementing agencies.

Sajeev-chandran (1989) found that there was significant difference in the level of awareness among beneficiaries and non-beneficiaries about pepper development programmes.

Ganesan (1989) found that officials had a higher level of awareness, while it was relatively lower in the case of farm leader and farmer beneficiaries about the agricultural development programmes. The schemewise analysis revealed that awareness for more number of schemes existed among farm leaders than that of farmer beneficiaries.

These studies could lead to a conclusion that there could be differences in the extent of awareness about the development programmes between beneficiaries and non-beneficiaries of coconut development programmes also. This led to the selection of awareness as a variable to be included in this study.

2.4.2. Attitude: Allport (1935) stated that attitude is a mental and neural state of readiness organised through

experience, excerting a direct dynamic influence upon the individuals's response to all objects and situations with which it is related.

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

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

Sureshkumar (1989) defined attitude as a summary statement or label for the individuals entire learning history with respect to attitudinal object.

2.4.2.1 Attitude towards development programmes : A brief review of studies on the similar development programmes is presented below.

Singh et al (1966) found that the farmers attitude towards the package programme had positive and significant influence in the level of adoption of package of practices.

Prasad (1978) in his study found positive and significant relationship between attitude of farmers towards functional literary programme related with agriculture and adoption behaviours.

Kher (1978) opined that the success of primary agricultural credit society largely depend upon farmers attitude towards organisation and their function.

Ponnappan (1982) found that 27 per cent of the beneficiaries have most favourable, 54 per cent favourable and 19 per cent less favourable attitude towards Fish farmers development programme.

Narayanaswamy (1988) found that 59.17 per cent of the contact farmers had more favourable attitude towards National Agricultural Extension Project and 40.83 per cent of contact farmers had less favourable attitude towards the project.

Sajeevchandran (1989) found significant difference in the level of attitude among beneficiaries and non-beneficiaries towards pepper development programmes.

Results of these studies indicated that there could be difference in the level of attitude among the beneficiaries and non-beneficiaries towards the selected development programmes. Hence this variable was also included in this study.

2.4.3. Knowledge : Websters new international dictionary defined knowledge as familiarity gained by actual experience, practical skill, technical acquaintance.

It has also been defined by Webster as "acquaintance with facts, state of being aware of something or of possessing information, hence scope of information.

Oxford English Dictionary defined knowledge in various ways but the most relevant definitions to this study are the following.

(a) Acquaintance with a branch of learning, a language or the life, theoretical or practical understanding of an art, science, industry etc.
(b) Intellectual acquaintance with perception of facts or truths, clear and certain mental apprehensions, the fact, state or condition of understanding

In scientific terms, knowledge is the totality of facts gained by human labour, experience and experiments; as well as fiction or mythological or artistical production learned irrationally through the use of mental and spiritual powers.

Fullerand Waldron(1989) opinioned that knowledge generation in agricultural sector developed along three main lines. Research information has largely informed the policy sector of agricultural development institutions and agencies of government, scientific advances has been adopted and further developed by agribusiness and industry, while the research and development in farming methods, storage, marketing and management techniques has been passed on to the farmers, through various types of technical service and extension services.

Pandeyand Sharma(1990) defined knowledge as familiarity gained by mental experience, practical skill and acquaintance or intellectual experiences with truths or merely acquaintance with facts. Thus knowledge is generally used synonym to acquaitnance, familiarity, fact or simply to know.

2.4.3.1 Effect of development programmes on knowledge about improved scientific practices:

A brief review of similar development programmes is presented below:

Samad (1979) found that in areas where pepper and coconut package programmes were implimented, knowledge of about improved scientific practices were more compared to other areas.

Waghmare et al (1988) observed that 19.33 per cent of the respondents (fruits and vegetable growers) were found to be in the low knowledge category, 60 per cent were located in medium knowledge category and one fifth of the respondents possess adequate knowledge about the Horticultural Development Programmes.

2.4.4. **Adoption:** Wilkening (1952) postulated adoption of an innovation as a process composed of learning, deciding and acting over a period of time. The adoption of decision to act have a series of actions and thought action.

Adoption has been defined by Copp et al. (1958) as an activity of farmer taking place over a period of time. They viewed adoption of farm practices as a bundle of related

events following through time, not an instantaneous metamorphosis.

Emery and Oeser (1958) viewed adoption of farm practices as a consequence of communication.

According to Ramsey et al (1959) adoption behaviours involve the actual use of the practice and cognitive adoption includes obtaining knowledge and critical evaluation of the practice in terms of individual situations.

According to Rogers (1983) adoption process is the mental process through which an individual passes from the first hearing of an innovation to its final adoption.

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

According to Rogers and Shoemaker (1970) adoption is the decision to continue full use of an innovation in the best course of action.

2.4.4.1 Effect of development programmes on adoption:
A brief review of similar studies is presented below:

Singh and Singh (1974) reported, National Demonstrations were effective in helping scientifically oriented farmers in adoption.

Kaleel (1978) reported that high adopters of improved agricultural practices were more in Intensive Paddy Development Programme implemented areas than in other areas.

Samad (1979) found that extent of adoption of improved scientific practices was more in coconut package programme areas, than in other areas. He also observed that programme participation and attitude had a significant influence on adoption behaviour of farmers.

Sivaramakrishnan (1981) observed that there was significant difference in the extent of adoption of individual practices within different crops viz, paddy, tapioca, coconut and rubber.

Sanoria and Sharma (1983) found that majority of the beneficiaries of Agricultural development programmes were at medium level of adoption.

Sudha (1987) found that the extent of adoption of transferred technology was more among tribal participant farmers of lab to land programme, than others.

These studies indicated that there could be a difference in the extent of adoption between beneficiaries and non beneficiaries of coconut development programmes. This led to the selection of adoption as a variable to be included in this study.

2.5 Independent Variables and there relationship with Dependant Variables.

2.5.1. Farm size

The following studies have shown positive and significant relationship between farm size and awareness of farmers about development programmes and improved scientific practices.

Sl.No.	Author	Year
1	Balu	1980
2	Mani	1980
3	Haraprasad	1982
4	Cheriyan	1984
5	Kunchu	1990

A few studies revealed no significant relationship between farm size and awareness of farmers. They are given below:

Sl.No.	Author	Year
1	Nandakumar	1980
2	Vijaya	1982

The following studies have shown a positive and significant relationship between farm size and attitude of farmers.

Sl.No.	Author	Year
1	Pillai	1978
2	Thangavelu	1979
3	Mani	1980
4	Subburaj	1980
5	Sirajudeen	1980
6	Pathak	1981
7	Kamarudeen	1981
8	Vijayakumar	1983
9	Krishnakumar	1987
10	Kunchu	1990

But some of the studies as given below, indicated farmsize had no significant relationship with attitude of farmers.

Sl.No.	Author	Year
1	Kher and Jha	1978
2	Sushama	1979
3	Prakash	1980
4	Ranganadhan	1982

A few studies showed a positive and significant relationship with farm size and knowledge of farmers about improved farming practices.

Sl.No	Author	Year
1	Sarkar and Reddy	1980
2	Haraprasad	1982

But Supe and Salode (1975) reported there is no relationship between farm size and knowledge of farmers about improved farming practices.

The following studies showed a positive and significant relationship between farm size and adoption behaviour of farmers.

Sl.No	Author	Year
1	Kaleel	1978
2	Pillai	1978
3	Rajendran	1978
4	Prakash	1980
5	Vijayakuma.	1983
6	Prasannan	1987
7	Bavalatti and Sundraswamy	1990

But a few studies showed the relationship between farm size and adoption behaviour as not significant. They are:

Sl.No.	Author	Year
1	Ravichandran	1980
2	Kamarudeen	1981
3	Anithakumari	1989

Based on the above studies it was assumed that farm size would influence, awareness, attitude, knowledge and adoption behaviour of beneficiary as well as non-beneficiary farmers of Coconut Development Programmes and hence this variable was included in this study.

2.5.2 Education

The relevant studies showing positive and significant relationship between education and awareness of farmers about development programmes are as follows:

Sl.No	Author	Year
1	Balu	1980

2	Mani	1980
3	Haraprasad	1981
4	Ponnappan	1982
5	Selvakumar	1988
6	Theodore	1988
7	Kunchu	1990

But Nandakumar (1980) found a negative relationship between education and awareness of farmers.

The review of studies showing positive and significant relationship between education and attitude of farmers towards development programmes is presented below:

Sl.No	Author	Year
1	Das and Sarkar	1970
2	Jayavelu	1980
3	Ravichandran	1980
4	Subburaj	1980
5	Kamarudeen	1981
6	Vijayakumar	1983
7	Latha	1990

But few authors reported the relationship between education and attitude of farmers towards development programmes as not significant. They are:

Sl.No	Author	Year
1	Kher and Jha	1978
2	Ranganadhan	1982
3	Narayana-swamy	1988

The following studies indicate a positive and significant relationship between education and knowledge of farmers about improved farming practices.

Sl.No	Author	Year
1	Bhaskaran and Mahajan	1968
2	Supe and Salode	1975
3	Kaleel	1978

Philip (1984) reported the relationship between education and knowledge of farmers about improved farming practices as not significant.

Various studies which concluded positive and significant relationship between education and adoption behaviour of farmers are given below:

Sl.No.	Author	Year
1	Kaleel	1978
2	Rajendran	1978
3	Kamarudeen	1981
4	Haraprasad	1982
5	Vijayakumar	1983
6	Prasannan	1987
7	Anithakumari	1989

But the following studies revealed no significant relationship between education and adoption behaviour of farmers.

Sl.No.	Author	Year
1	Pillai	1978
2	Ravichandran	1980

Subhadra (1979) and Swaminathan (1986) found no relationship between education and adoption behaviour of farmers.

In view of the results of the above studies, it was decided to test the relationships between education and awareness,

attitude, knowledge and adoption behaviour of beneficiary and non-beneficiary farmers.

2.5.3. Farming Exeperience

Nandakumar (1980) found that there was no relationship between farming experience and awareness of farmers about development programmes.

Balu (1980) found a significant relationship between farming experience and awareness of farmers about development programmes.

Ravichandran (1980) reported a positive and significant relationship between farming experience and attitude of farmers towards development programmes.

But Jayavelu (1980) reported a negative and significant relationship between farming experience and attitude of farmers towards development programmes.

Grewal and Sohal (1971) and Anbalagan (1976) reported a significant relationship between farming experience and adoption behaviour of farmers.

not significant.

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

2.5.4. Social Participation

All the studies reviewed, presented below revealed positive and significant relationship between social participation and awareness of farmers.

Sl.No.	Author	Year
1	Mani	1980
2	Balu	1980
3	Nandakumar	1980
4	Haraprasad	1981

The following studies indicated positive and significant relationship between social participation and attitude of farmers towards development programmes.

Sl.No.	Author	Year
1	Subburaj	1980
2	Ravichandran	1980
3	Latha	1990

But Thangavelu (1970) and Ranganathan (1982) reported a significant relationship between social participation and attitude of farmers towards development programmes.

Kaleel (1978) and Kamarudeen (1981) reported a positive and significant relationship between social participation and knowledge of farmers about improved farming practices.

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

Sl.No	Author	Year
1	Ramamoorthy	1973
2	Anbalagan	1974
3	Kaleel	1978
4	Ravichandran	1980
5	Krishnamoorthy	1985
6	Bavalatti and Sundaraswamy	1990

But the following studies revealed no significant relationship between social participation and adoption behaviour of farmers.

Sl.No.	Author	Year
1	Bhaskaran	1978
2	Dudhani *et al*	1987
3	Anithakumari	1989

Prasannan (1987) reported a significant relationship between social participation and adoption behaviour of farmers.

Balasubramaniam (1985) reported a negative and significant relationship between social participation and adoption behaviour of farmers.

Based on the above studies it was assumed that social participation would influence the awareness, attitude, knowledge and adoption behaviour of beneficiary and non-beneficiary farmers and hence this variable was included in the study.

2.5.5. Economic motivation

All the studies reviewed, as presented below, revealed significant relationship between economic motivation and awareness of farmers about development programmes.

Sl.No.	Author	Year
1	Nandakumar	1980
2	Mani	1980
3	Aristotle	1981

All the studies reviewed, as presented below, showed a positive and significant relationship between economic motivation and attitude of farmers towards development programmes.

Sl.No.	Author	Year
1	Sarkar	1970
2	Kher and Jha	1978
3	Thangavelu	1979
4	Subburaj	1980
5	Jayavelu	1980

Various studies which concluded positive and significant relationship between economic motivation and adoption behaviour are given below :

Sl.No	Author	Year
1	Hobbs	1964
2	Beal and Sibley	1967
3	Nair	1969
4	Das and Sarkar	1970
5	Singh and Singh	1970
6	Raj	1978
7	Rajendran	1978
8	Shukla	1980
9	Krishnamoorthi	1984
10	Singh and Ray	1985
11	Prasannan	1987
12	Balan	1987

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

Sl.No.	Author	Year
1	Balu	1980
2	Manivannan	1980

3	Anithakumari	1989

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

2.5.6 Scientific Orientation

Various studies which concluded positive and significant relationship between scientific orientation and awareness of farmers about development programmes are given below:

Sl.No	Author	Year
1	Nandakumar	1980
2	Kamarudeen	1981

But Naik (1981) found no relationship between scientific orientation and attitude, while Cheriyan (1984) reported the relationship as negative and not significant.

Kamarudeen (1981) and Syamala (1988) found a positive and significant relationship between scientific orientation and knowledge of farmers about improved farming practices.

Studies which revealed positive and significant relationship between scientific orientation and adoption behaviour are given below:

Sl. No.	Author	Year
1	Beal and Sibley	1967
2	Reddy and Kelvin	1968
3	Supe and Salode	1975
4	Somasundaram	1976
5	Palaniswamy	1978
6	Thankaraju	1979
7	Aristotle	1981
8	Jayapalan	1985
9	Krishnamoorthy	1985
10	Wilson and Chaturvedi	1985
11	Prasannan	1987
12	Reddy and Reddy	1988
13	Anithakumari	1989
14	Sajeev chandran	1989
15	Umale et al	1991
16	Ramachandran	1992

But Sakthivel (1979) found the relationship as not significant while Swaminathan (1986) supported the finding only in the case of participant farmers.

was decided to include this variable also in the present study.

2.5.7. Mass media exposure :

All the studies reviewed as presented below, revealed positive and significant relationship between mass media exposure and awareness of farmers about development programmes.

Sl.No.	Author	Year
1	Mani	1980
2	Nandakumar	1980
3	Haraprasad	1982
4	Ponnappan	1982
5.	Selvakumar	1988
6	Theodore	1988
7	Kunchu	1990

The following studies indicated a positive and significant relationship between mass media exposure and attitude of farmers towards development programmes are directly related.

Sl.No.	Author	Year
1.	Jayavelu	1980
2.	Pathak	1981
3.	Krishnakumar	1987
4.	Narayanaswamy	1988
5.	Kunchu	1990

All the studies reviewed presented below, revealed a positive and significant relationship between mass media exposure and knowledge of farmers about improved farming practices.

Sl.No.	Author	Year
1	Haraprasad	1982
2	Syamala	1988

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

Sl.No.	Author	Year
1	Vellapandian	1974
2	Mahadevaswamy	1978
3	Bhaskaran	1979
4	Singh and Singh	1980

5	Haraprasad	1982
6	Sanoria and Sharma	1983
7	Hirevenkana goudar et al.	1984
8	Lekshminarayanan	1984
9	Balasubramaniam	1985
10	Mishra and Jha	1985
11	Swaminathan	1986
12	Burns	1987
13	Sankaran	1987
14	Jaiswal and Sharma	1990
15	Satheesh	1990
16	Umale et al.	1991
17	Ramachandran	1992

But the following studies revealed no significant relation between mass media exposure and adoption behaviour.

Sl.No.	Author	Year
1	Rajendran	1978
2	Chandrasekharan	1979
3	Tyagi and Sohal	1984
4	Swaminathan	1986
5	Sheoran and kumar	1988
6	S yamala	1988

In view of the results of the above studies, it was decided to test the relationship between mass media exposure and awareness, attitude, knowledge and adoption behaviour of the sample farmers.

2.5.8. Extension Contact

All the studies reviewed presented below revealed a positive and significant relationship between extension contact and awareness of farmers about development programmes.

Sl.No.	Author	Year
1	Haraprasad	1982
2	Selvakumar	1988
3	Kunchu	1990

Following studies revealed a positive and significant relationship between extension contact and attitude of farmers towards development programmes.

Sl.No.	Author	Year
1	Ravichandran	1980
2	Sirajudeen	1980

Baldeosingh (1990) reported that extension contact and attitude of farmers were related.

All the studies reviewed presented below revealed a positive and significant relationship between extension contact and knowledge of farmers about improved farming practices.

Sl.No.	Author	Year
1	Knight and Singh	1975
2	Kaleel	1978
3	Kamarudeen	1981
4	Haraprasad	1982
5	Syamala	1988

The relevant studies showing positive and significant relationship between extension contact and adoption behaviour are summarised below:

Sl.No.	Author	Year
1	Anithavijayan	1988
2	Krishnamoorthy	1988
3	Syamala	1988

Bavalatti and Sundaraswamy (1990) found no relationship between extension contact and adoption behaviour of farmers.

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

2.6. Constraints perceived by the Farmers and Agricultural Officers in the implementation of coconut de programmes

Some of the closely related studies reviewed are as follows:

Parameswaran (1973) identified lack of knowledge, poor efficiency, unsuitability of soil and lack of conviction among farmers as the important reasons for non-adoption of package programme of cotton.

Anbalagan (1976) showed that lack of knowledge and conviction among farmers as main reasons for non adoption of package of practices for high yielding varieties of paddy.

Viswanathan (1975) in his study found high cost of cultivation as the limiting factor in the adoption process.

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

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

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

Syamala (1988) found that lack of followup, lack of need based training and inappropriate way of conducting field days were the most felt constraints by farmer-demonstrations.

2.7 Theoretical concepts and operational definitions of the selected variables.

2.7.1. Coconut development programmes

They are development programmes implemented by the Government, and intended for the farmers to be aware, to develop a favourable attitude, and finally adopt the improved agricultural practices followed under the programmes to promote coconut cultivation.

The major programmes implemented by various government agencies like Department of Agriculture, Coconut Development Board and Kera karshaka Sahakarana Federation (KERAFED) are

1. Scheme for the expansion of area under coconut.
2. Scheme for providing assistance for developing irrigation facilities in coconut gardens.
3. Integrated farming in coconut small holdings for productivity improvement.

4. Scheme for the production & distribution of TxD coconut seedlings.

5. Comprehensive spraying programme for the control of pest and diseases.

6. Scheme for adopting Group management in coconut gardens.

7. Minikit programme for distribution of coconut seedlings free of cost to small and marginal farmers.

8. Scheme for distribution of quality coconut seedlings, at 50 percent subsidy.

9. Scheme for the rejuvenation of root (wilt) affected coconut gardens of Kerala.

10. Coconut package programme implemented by Special Agricultural Development Units (SADU).

11. Scheme for providing assistance for installing drip irrigation units in coconut gardens.

12. Scheme for promoting fertilizer application in coconut gardens by providing subsidy.

13. Scheme for providing assistance to artisans for making handicrafts using the coconut shell, wood, leaf etc.

14. Scheme for establishment demonstration plots to promote adoption of improved coconut farming practices.

15. Scheme for coconut technology development including post harvest processing and marketing.

16. Scheme for providing training to unemployed youths in conducting harvesting and plant protection operations.

From the above programmes, three major programmes of the Coconut Development Board, which are being implemented through the Kerala State Department of Agriculture are selected for the study. They are:

1. Scheme for expansion of area under coconut,
2. Scheme for providing assistance for irrigation facilities in coconut gardens and
3. Integrated farming programme in coconut small holdings of Kerala for productivity improvement.

2.7.2. Analysis of Coconut Development Programme

Various methods have been used by different researchers to analyze the different development programmes.

Samad (1979) studied the impact of package programme by measuring level of knowledge about the package programme, extent of adoption of improved agricultural practices and the farmers participation in the package programme.

Ponnappan (1982) analyzed Fish farmers development programmes by measuring the awareness about the facilities of fish farmers development programmes and attitude of farmer towards development programmes.

Sajeevchandran (1989) studied the impact of pepper development programmes in promoting pepper production in Kerala by measuring the level of awareness and attitude of pepper growers towards pepper development programmes and the extent of adoption of improved farming practices under the selected programmes .

Kunchu (1990) studied the constraints in the utilisation of development schemes by cardamom growers, by measuring the awareness, and attitude of cardamom growers towards cardamom development schemes, and extent of utilization of the number of development schemes of the Spices Board in promoting cardamom production in Kerala.

In this study, analysis of selected coconut development programmes was done by measuring the awareness of farmers, both beneficiaries and non-beneficiaries, about different coconut development programmes, attitude of farmers towards coconut development programmes, level of knowledge and extent of adoption of recommended improved agricultural practices under the coconut development programmes, and the constraints in the adoption and implementation of development programmes.

2.7.3. Beneficiaries

In this study beneficiaries are coconut cultivators who availed inputs through the concerned programmes, as kind or cash or both, intended to raise the coconut production.

2.7.4. Non beneficiaries

In this study, non beneficiaries are also coconut cultivators, but who did not avail inputs through any coconut development programmes, in kind or cash or both.

2.7.5. Awareness

Lionberger (1960) defined awareness as the first knowledge about a new idea, product or practice. At the awareness stage, a person has only a general information about it.

In this study, awareness was operationally defined as the general information possessed by coconut growers about coconut development programmes.

2.7.6. Attitude

In this study, attitude was operationally defined as the degree of positive or negative affect of farmers towards selected coconut development programmes.

2.7.7. Knowledge

In this study knowledge was operationally defined as acquintance with theoretical and practical understanding of improved coconut farming practices recommended through the coconut development programmes.

2.7.8. Extent of adoption

Adoption behaviour was operationalized as the extent to which the recommended improved farm practices of coconut cultivation are put in to practice by the beneficiaries and non-beneficiaries of Coconut Development Programmes.

2.7.9. Farm size

Farm size has been operationally defined as the number of acres of land cultivated and owned by the respondent, at the time of the interview.

2.7.10. Farming Experience

Farming experience was operationally defined as the number of years, the respondent has completed in the cultivation of coconut crop, at the time of the interview.

2.7.11. Education

Education in this study, was identical with the level of literacy and refers to the ability of the respondents to read and write and the extent of schooling

2.7.12. Economic motivation

Economic motivation has been operationally defined as the extent to which a farmer is oriented towards achievement of maximum profit from coconut cultivations.

2.7.13. Scientific Orientation

Scientific orientation was operationally defined as the degree to which a farmer is oriented to the use of scientific methods in decision making in farming.

2.7.14. Social participation

Social participation was defined as the degree to which a respondent involved in formal organisation either as member or as office bearer.

2.7.15. Extension contact

Extension contact was operationally defined as the degree to which an individual is in contact with extension agencies to gain information of agricultural/or allied aspects such as development schemes.

2.7.16. Mass media exposure

Mass media exposure was operationally defined as the degree to which different mass media sources viz. radio, newspaper, magazines, films and agricultural fairs, were utilized by coconut growers for gathering informations.

2.8 Hypothesis set for the study

Based on the extensive theoretical orientation and review of literature, the following null-hypothesis were formulated.

1. There will be no significant difference between beneficiaries and non-beneficiaries of Area expansion programme with respect to their level of awareness.

2. There will be no significant difference between beneficiaries and non beneficiaries of Area expansion programme with respect to their attitude.

3. There will be no significant difference between the beneficiaries and non-beneficiaries of Area expansion programme with respect to their level of knowledge.

4. There will be no significant difference between the beneficiaries and non-beneficiaries of Area expansion programme with respect to their extent of adoption.

5. There will be no significant difference between the beneficiaries and non-beneficiaries of Irrigation programme with respect to their level of awareness.

6. There will be no significant difference between beneficiaries and non-beneficiaries of Irrigation programme with respect to their level of attitude.

7. There will be no significant difference between beneficiaries and non-beneficiaries of Irrigation programme with respect to their level of knowledge.

8. There will be no significant difference between beneficiaries and non-beneficiaries of Irrigation programme with respect to their extent of adoption.

9. There will be no significant difference between the beneficiaries and non-beneficiaries of Integrated farming programme with respect to their level of awareness.

10.There will be no significant difference between the beneficiaries and non-beneficiaries of Integrated farming programme with respect to their level of attitude.

11.There will be no significant difference between the beneficiaries and non-beneficiaries of Integrated farming programme with respect to their level of knowledge.

12.There will be no significant difference between the beneficiaries and non-beneficiaries of Integrated farming programme with respect to their level of adoption.

13.There will be no significant relationship between the awareness of farmers about coconut development programmes with respect to characteristics of farmers viz. farmsize, farming experience, education, social participation, economic motivation, scientific orientation extension contact and mass media exposure.

14.There will be no significant relationship between attitude of farmers towards coconut development programmes with respect to characteristics of farmers viz, farm size, farming experience, education, social participation, economic motivation, scientific orientation, extension contact and mass media exposure.

15.There will be no significant relationship between level of knowledge of farmers about improved coconut farming practices, with respect to characteristics of farmers viz, farmsize, farming experience, education social participation, economic motivation, scientific orientation, extension contact and mass media exposure.

16.There will be no significant relationship between extent of adoption of improved coconut farming practices by farmers with respect to characteristics viz, farmsize, farming experience education, social participation, economic

motivation, scientific orientation, extension contact and mass media exposure.

17.There will be no significant difference between the beneficiary farmers of the three selected coconut development programmes, with respect to their level of awareness, attitude, knowledge and extent of adoption.

METHODOLOGY

3. METHODOLOGY

This chapter deals with the methodology employed in this study, which are presented under the following subheadings.

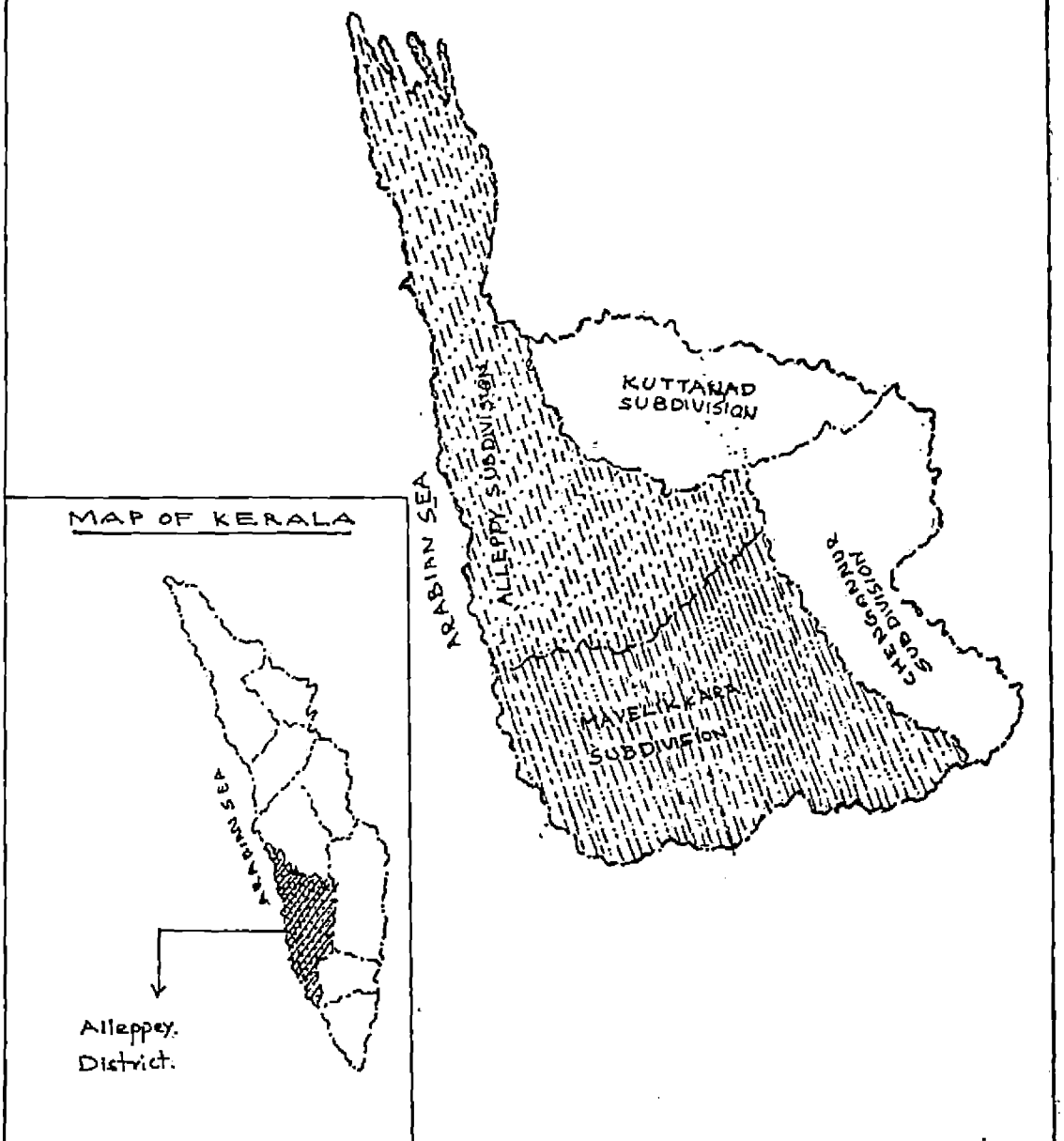
3.1. Locale of the study
3.2. Selection of sample
3.3. Measurement of dependent and independent variables.
3.4. Identification of problems or constraints.
3.5. Procedure for Data Collection.
3.6. Statistical tools used.

3.1. Locale of the study

This study was confined to Alapuzha district in Kerala State. This district was purposively selected, as Alapuzha ranks first while considering the total number of beneficiaries under the development programmes, selected for the study.

Another reason for the selection of Alapuzha district was that the three coconut development programmes viz, scheme for the expansion of area under coconut, providing assistance for developing irrigation facilities in coconut

Fig-I MAP SHOWING THE LOCATION OF STUDY IN ALLEPPY DISTRICT.



garden and Integrated farming for coconut small holdings for productivity improvement were implemented here.

3.2. **Selection of sample:** A 3 stage random sampling procedure was adopted for the study.

The district consist of four agricultural sub-divisions viz, Alapuzha, Kuttanad, Mavelikkara and Chengannur. Two sub-divisions viz, Alapuzha and Mavelikkara where all the three selected development programmes implemented were purposively selected for the study. From each sub-division, one block viz, Ambalapuzha and Bharanicavu, where all the three development programmes implemented were purposively selected. From each block two Krishi Bhavans where all the three development programmes implemented were purposively selected. They are Punnapra and Ambalapuzha from Alapuzha Block and Kayamkulam and Bhavanicavu from Bharanicavu Block vide Table-I.

Table - 1 : List of Krishi Bhavans and number of respondents selected for the study

Sl. No.	Name of Krishi Bhavan	Beneficiaries (No.)	Non-beneficiaries(No.)	Total (No.)
1.	Punnapra	30	15	45
2.	Ambalapuzha	30	15	45
3.	Kayamkulam	30	15	45
4.	Bharanicavu	30	15	45
	Total	120	60	180

The sample comprised of one hundred and eighty coconut cultivators which included both beneficiaries and non-beneficiaries of coconut development programmes.

From each selected Krishi Bhavan area, forty five farmers were selected at random. Of these, thirty were beneficiaries of coconut development programmes ie, ten beneficiaries each of area expansion programme, irrigation programme and integrated farming programme for productivity improvement respectively.

For comparison, fifteen non-beneficiary farmers were also selected from each Krishi Bhavan.

For identifying the constraints in the implementation of coconut development programmes fifty Agricultural Officers from both the sub-divisions were also selected for the study.

Thus the total sample comprised of One hundred and twenty beneficiary farmers, sixty non-beneficiary farmers and fifty Agricultural Officers.

3.3. Measurement of dependant and independent variables

This part includes a review of methods of measurement of variables already used by different researchers and the empherical measures used in this study.

3.3.1. Measurement of dependent variables

3.3.1.1. Awareness about Coconut Development Programmes:

Various researchers have used different methods to measure awareness. Notable among them are given below:

Gaikwad (1971) studied awareness of participant farmers of Integrated Area Development Scheme, by asking few questions to find out whether they were aware or not about the scheme and awareness was measured by calculating percentage of farmers aware and unaware of the programme.

Khan (1978) measured awareness by asking the respondents, whether they were aware of certain programmes of the government for improving the conditions of small farmers.

Salunkhe (1978) measured awareness of farmers by asking questions on the activities of Small Farmers Development Agency (SFDA) viz, publicity about SFDA, method of getting

benefits, method of granting subsidies supervision of loan, arranging services, supplies and technical guidance.

Naik (1981) measured awareness of farmers about T & V system, by asking a number of questions on several aspects of the system. The scoring index developed for the purpose of the study was used as a guideline to score each response. By summing up these scores on different individual items the total score on awareness was calculated.

Kunchu (1990) also used the same method to assess the awareness of cardamom growers about development programmes.

In this study, the procedure adopted by Naik (1981) with slight modification as used by Kunchu (1990), was followed to measure the awareness of respondents about coconut development programmes.

Scoring procedure:

The list of coconut development programmes implemented by the Department of Agriculture, Coconut Development Board and Kerakarshaka Sakaharana Federation (KERAFED) in Alapuzha district was first prepared. The respondents were asked to express their awareness about the schemes by giving either `aware' or `unaware' response to each scheme. The responses

were quantified by assigning a score of two and one for aware or unaware of the schemes respectively.

3.1.1.2. Attitude towards selected Coconut Development Programmes: Attitude was measured by an attitude scale. In this study, attitude of coconut growers-both beneficiaries and non-beneficiaries-towards the three selected coconut development programmes was measured using the attitude scale, constructed for the purpose.

A number of attitude scale has been developed in the past for measuring the attitude of respondents towards a technology, or practice or programme.

Cherian (1984) had developed an attitude scale for measuring the attitude of farmers towards T & V system using Likerts (1932) method.
Kunchu (1990) also used the Likerts method of summated rating to measure the attitude of cardamom growers towards development schemes.

In the present study also, attitude of coconut growers towards the selected development programmes was measured by using an attitude scale developed for the purpose utilizing Likerts summated rating technique.

As a first step, the statements regarding different aspects of coconut development programmes were collected on the basis of review of literature and discussion with officials of Department of Agriculture and Coconut Development Board. Care was taken to develop a universe of content including all possible statements that would reflect the attitude of respondents towards the stimulus under study. The collected statements were then edited by comparing against the criteria described by Edwards (1957). Out of the total of 50 statements, 42 statements were selected after editing. Care was taken to include both positive and negative statements on coconut development programmes.

The edited statements were administered to 48 beneficiaries of the selected coconut development programmes in Thiruvananthapuram and Kollam district. They were asked to respond to each statement in terms of their own agreement or disagreement with the statements on a five point continuum as follows:

SA- Strongly Agree

A- Agree

UD- Undecided

DA- Dis Agree

SDA- Strongly Dis Agree

After collecting responses from the farmers these statements were subjected to item analysis. The purpose of item analysis is to examine how well each statement discriminates between respondents with different attitudes.

The procedure involved in item analysis as suggested by Edwards (1957) was followed.

First of all, the total score was found out for each respondent by summing up the scores obtained for all statements in the list. The various responses were assigned numerical weights such that strongly agree response was given score of 5, agree 4, undecided 3, disagree-2 and strongly disagree-1 for positive statements. The order was reversed for negative statements. Thus the total score of an individual was the summation of numerical weights assigned to the responses. The respondents were then arranged in decending order of total scores. From these 25 percent of the subjects with the highest total score and 25 percent of subjects with lowest total score were taken up for item analysis. It was assumed that these two groups would provide the criterion group in terms of which one evaluate an individual statement.

The following formula was used for evaluating the responses of the high and low group to each statement.

$$t = \frac{\overline{XH} - \overline{XL}}{\sqrt{\frac{\Sigma(XH - \overline{XH})^2 - \Sigma(XL - \overline{XL})^2}{n(n-1)}}}$$

Where $\Sigma(XH - \overline{XH})^2 = \Sigma XH^2 - \frac{(\Sigma XH)^2}{n}$

$\Sigma(XL - XL)^2 = \Sigma XL^2 - \frac{(\Sigma XL)^2}{n}$

$\overline{XH}$ = the mean score of a given statement for the high group

$\overline{XL}$ = the mean score on the same statement for the low group

This formula was chosen because the respondents in the low and high group are equal.

The value of 't' is a measure of the extent to which a given statement differentiate between the high group and low group. As an appropriate rule of thumb, any value of 't' equal or greater than 1.75 only was considered. Statements with 't' values were arranged in ascending order of

magnitude, and eight statements having maximum `t' values were selected for the final scale which consisted of four positive and four negative statements. The statements with their `t' values are appended in Appendix-3.

Reliability of the scale

Guilford (1954) has defined reliability as the proportion of variance in the obtained test score. Hence a scale can be considered reliable only when it consistently produces the same or similar results when applied to the same sample. The Split half method was used in the present study for testing the reliability of the scale.

Split half method

The developed scale containing the eight statements was administered to 30 beneficiaries of the selected coconut development programmes of Thiruvananthapuram district. The statements were split in to two equal halves using odd and even number method. Thus two sets of score were obtained. Correlation coefficient(r) worked out between the two sets of scores (0.81) which was significant indicating that the scale was reliable.

Validity: There are usually three types of validity, content, criterion and construct validity. Among these content and construct validity of the scale were tested in this case.

(a) Content validity: The criterion for content validity is how well the content of the scale represents the subject under study. The present scale has this validity, since all the possible items with in the universe of content had been selected.

(b) Construct Validity: The construct validity was tested by calculating the correlation coefficient between education and attitude score. The attitude and education scores of 30 respondents were calculated and correlation coefficient was found out by comparison. The 'r' value, 0.851 which was significant. So it is proved, that scale has construct validity.

The attitude scale thus developed was incorporated in the interview schedule and administered to 180 respondents of the study area with necessary modifications so as to measure the attitude of different catagories of respondents towards selected Coconut Development Programmes.

3.1.1.3. Knowledge about recommended coconut farming practices : Nair (1969) measured knowledge of farmers on recommended practices of rice using teacher made test with multiple choice questions.

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

$$\text{Total knowledge score} = \frac{X1 \times 100}{n}$$

Where X1 = Number of correct answers

n = Total number of questions

For the present study a `teacher made test' was developed using the procedure detailed below:

Statements were formulated based on the improved scientific practices of coconut cultivation according to the package of practices of Kerala Agricultural University (1989). These statements formed the items to be included in the knowledge test. Care was taken to construct items related to each

practice of the package. In this way 12 items were constructed to develop a knowledge test.

The maximum score attainable by a respondent for this test was 12 and the minimum was zero.

The median of the knowledge score was calculated and above median represents high level of knowledge and below median represented low level of knowledge.

3.1.1.4. Extent of adoption : Various researchers have used different methods for measuring the adoption.

Wilkening (1952) developed an adoption index, which was the percentage of new practices adopted by a farmer to the number of practices available to him.
Dasgupta (1963) developed an adoption quotient by adding a new element viz. time.

Chattopadhyay (1963) has constructed a comprehensive scale called " Adoption Quotient" to measure the farm practices adopted. He took into consideration the different variable like potentiality, applicability, time, consistency, extent, differential nature of innovations.

Singh and Singh (1970) used an "Adoption Quotient" which was a modification of the one developed by Chattopadhayay (1963)

In the present study the extent of adoption of recommeded coconut farming practices was measured by the 'Adoption Quotient' as developed by Chattopadhayay (1963) with slight modification, as used by Jaiswal and Dave (1972). Bhaskaran (1978) also used the same method in his study. The data regarding the extent of adoption of selected practices in coconut cultivation has been taken as the sum total of adoption of various cultivation practices recommended by the Kerala Agricultural University (Appendix-1) In calculating the adoption quotient, the adoption of hybrid varieties of seedling for new planting in acres, practices followed pertaining to filling the pits with top soil while planting, spacing, irrigation, manuring, use of N.P K fertilizers, plant protection chemicals used and inter/mixed cropping, were taken into consideration

The formula used for computing adoption quotient as given by Jaiswal and Dave (1972) was as follows:

$$AQ = \frac{e_1/p_1 + e_2/p_2 + e_3/p_3 + e_4/p_4 + e_5/p_5 + e_6/p_6 + e_7/p_7 + e_8/p_8}{N} \times 100$$

where e_1 = Extent of adoption of hybrid varieties of coconut seedlings for planting

p_1 = Potentiality of for adoption of hybrid varieties of coconut seedlings for planting

e_2 = Extent of adoption of filling the pits with top soil while planting

p_2 = Potentiality of filling the pits with topsoil while planting

e_3 = Summation extent of adoption spacing

p_3 = Summation of potentiality of adoption of spacing

e_4 = Summation of extent of adoption of frequency and number of palms irrigated.

p_4 = Summation of potentiality of frequency and number of palms irrigated.

e_5 = Summation of extent of adoption of organic manners per coconut palm per year

p_5 = Summation of potentiality of adoption of organic manners

e_6 = Summation of extent of adoption of fertilizer in terms of N.P.K, per palm per year, under rainfed & irrigated conditions.

p_6 = Summation of potentiality of adoption of fertilizers in terms of N.P.K under rainfed & irrigated conditions

e_7 = Summation of extent of adoption of P.P chemicals for the control of pest and diseases of coconut

p_7 = Summation of the potentiality of adoption of P.P chemicals for the control of pests & diseases of coconut

e_8 = Summation of extent of adoption of intercropping/mixed cropping in terms of area in coconut gardens

p_8 = Summation potentiality of adoption of inter/mixed cropping in terms of area

Potentiality of adoption

Potentiality of adoption of hybrid varieties of coconut is conceived as the maximum area possessed by the farmer suitable for cultivating coconut. Potentiality of adoption of different practices, which were taken into consideration for calculating the adoption quotient, were the recommendations given by Kerala Agricultural University, through the package of practices.

Extent of adoption

Extent of adoption is the degree to which a farmer has actually adopted a practice. When extent of adoption equals the potentiality, the adoption is maximum, and when the

extent is nil, adoption is nil. In the present study the extent of the adoption for each practice was calculated.

From the adoption score median was calculated. The score above the median represents high level of adoption and below the median, a low level of adoption.

3.3.2. Measurement of Independent variables

3.3.2.1. Education: In this study, to measure educational level of respondent, the scoring system followed by Trivedi (1963), which suitable modifications was adopted. The scoring system used was as follows:

Illiterate	- 0
Can read only	- 1
Can read & write	- 2
Primary level	- 3
Middle school	- 4
High school	- 5
College & above	- 6

3.3.2.2. Farm size: In this study, farm size of the respondent was measured as the number of acres of land cultivated and owned by him.

3.3.2.3. Farming experience: Farming experience was measured as the number of years, the respondent has completed in the cultivation of coconut, at the time of interview.

3.3.2.4. Economic motivation: In this study, economic motivation was measured using the scale developed by Supe (1969). This scale consisted of six statements of which five were positive and one negative. Responses were measured on a five point continuum with scores as follows: Strongly agree-7, Agree-5, Undecided-4, Disagree-3 and strongly disagree-1 for positive items and scoring pattern was reversed for negative items.

Then the total score was calculated and mean of the scores were taken. Scores of the respondent obtained above mean considered as high economic motivation and below the mean as low economic motivation.

3.3.2.5. Scientific orientation: In this study scientific orientation was measured by using a scale developed by supe (1969). His scale consisted of six statements of which one was negative. Responses were collected on a three point continuum with scores as follows: Agree-5, undecide-3 and disagree-1 for positive items and the scoring pattern was reversed for negative items.

The total score obtained by each respondent was considered as the score of scientific orientation.

3.3.2.6. Social participation: In this study social participation was measured using scoring system followed in the socio economic status scale of Trivedi (1963), which is as follows:

	Score
Membership in one organisation	1
Membership in more than one organisation	2
Office bearer	3
Distinctive features	6

The total score obtained by each respondent was considered as the score of his social participation.

3.3.2.7. Mass media exposure: In this study, mass media exposure was measured by using the scale developed by Anantharaman (1977). The scoring system used is as follows:

Medium	Frequency	Score
a. Radio	Never	0
	Rarely	1
	Once a fort night	2
	Once a week	3

	Two to six days a week	4
	Daily	5
b. News paper	Never read	0
	Rarely	1
	Once a fort night	2
	Once a week	3
	Two to six days a week	4
	Daily	5
c. Magazines	Never read	0
	Rarely	1
	Once a fortnight	2
	Once a week	3
	Two to six days a week	4
	Daily	5
d. Leaflets Bulletins	Never	0
	Occassionally	1
	Regularly	2
e. Films (seen during last year related to Agriculture)	Never	0
	Occasionally	1
	Frequently	2
	Most frequently	3

f. Field days/ Agricultural functions (attended during last year)	More than six	3
	Four to six	2
	One to three	1
	None	0

Scores in all these items are summed up to get total mass media exposure score for individual respondent.

3.3.2.8. Extension contact:

The method used by Bhaskaran (1979) was used with slight modification. The extent of extension contact by the farmers was computed by giving scores to the items as below:

Frequency of meeting Agricultural Assistant/Agricultural Officer/ Assistant Director of Agriculture, officers from Coconut Development Board.

Two or more times a week	3
Once a week	2
Once to thrice a month	1
Never	0

3.4. Identification of constraints

One of the objectives of the study was to identify the constraints, experienced by the Agricultural Officers in the implementation of coconut development programmes, and the constraints with regard to the adoption of recommended agricultural practices by the coconut growers under the coconut development programmes.

Various researchers have used different methods to identify the constraints. Notable among them are given below:

Samad (1979) identified constraints in the proper functioning of the coconut package programme, using the 'cumulative index' technique.

Ramanathan (1987) developed a 'constraint index' for measuring the constraints in the adoption of high yielding cassava varities.

Prakash (1989) used 'delphi technique' for measuring the constraints in increasing coconut & vice production in Kerala.

Sajeevchandran (1989) identified constraints in the adoption of recommended agricultural practices under the pepper

development programmes, by asking the respondents to speak out the constraints on a priority basis and based on the frequencies of pooled constraint they were numerically ranked.

In this study, to identify the constraints, experienced by the Agricultural Officers in the implementation of coconut development programmes, the method used by Samad (1979) is used and to identify the constraints in the adoption of recommended agricultural practices by the coconut growers, under the development programmes, the method followed by Sajeevachandran (1989) was used.

Based on the discussion with Agricultural Officers, in the Department of Agriculture and Officers of Coconut Development Board, a list of constraints in the implementation of coconut development programmes was first prepared. This list of identified constraints were presented to the Agricultural Officers to indicate whether they experience such problems or not. Based on the results modifications were made. Finally twenty one items were selected for inclusion in the questionnaire. The response to each item was obtained on a 3 point continuum most important, important and least important.

To find out the importance of constraints, identified, a cumulative index was calculated. For this weightages were given at 3,2 and 1 for most important, important and least important respectively. The frequency of responses under each category was multiplied with corresponding weightage and added to get a cumulative index. Based on the cumulative index, the constraints were ranked in the order of importance.

To identify the constraints as perceived by the coconut growers, they were asked to speak out the constraints in the cultivation of coconut in the order of importance. These constraints were recorded by the researcher. Based on the frequency of the pooled constraints, they were numerically ranked from one to ten.

3.5 Procedure for data collection :

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

Data collection was carried out during June-July 1992 Data from the Agricultural Officers were also collected in person by supplying them with the questionnaires.

3.6 Statistical methods employed

3.6.1. Simple correlation Analysis.

To study the relationship between each independent variable and dependent variable simple correlat' n analysis was done. The formula used was

$$\text{Correlation Coefficient}(r) = \frac{\Sigma xy - (\Sigma x \ \Sigma y)/n}{\sqrt{(\Sigma x^2 - (\Sigma x)^2/n)\cdot(\Sigma y^2 - (\Sigma y)^2/n)}}$$

Where

x = independent variable

y = dependent variable

n = number of observations

3.6.2. Kruskal-wallis Test

This is equivalent to analysis of variance in parametric case. Kruskal-Wallis test was employed for comparison among dependent variables between beneficiaries of the three coconut development programmes. Here all the observations are pooled together and then ranks are assigned to this course.

The formula used to compute the test was

$$X^2 = 12/n(n+1) \sum_{j=1}^{k} \frac{R_j^2}{nj} - 3(n+1)$$

Rj = Total of ranks in jth sample

k = Number of independent samples

nj = Total number of observations

3.6.3. Mann Whitney U Test

This test was used to test whether there was significant difference between the two groups of respondents, the beneficiaries non-beneficiaries of coconut development programmes with respect to the dependent variables.

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

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

$$U = n_1 n_2 + \left\{ \left[n_1 (n_{1+}1) \right] /2 \right\} - R_1$$

Where

n1 = number of observations in group 1

n2 = number of observations in group 2

R1 = sum of the ranks in the first or sample of size n1

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

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

Where

u = number of times the scores in one group precedes the scores of other group

n_1 = number of observations in group 1

n_2 = number of observations in group 2

RESULTS

4. RESULTS

In this chapter, the results of the study are presented under the following sub-heads.

4.1. Level of awareness, attitude, knowledge and adoption of recommended practices by the beneficiary and non-beneficiary farmers of the three selected coconut development programmes.

4.2. Relationship of level of awareness, attitude, knowledge and extent of adoption of beneficiary and non-beneficiary farmers with their selected characteristics.

4.3. Interrelationship of level of awareness, attitude, knowledge and extent of adoption of farmer respondents.

4.4 Comparison of beneficiaries of the three programmes according to their level of awareness, attitude, knowledge and extent of adoption.

4.5. Comparison of beneficiaries and non-beneficiaries according to their level of awareness, attitude, knowledge and extent of adoption.

4.6. Constraints as perceived by farmers.

4.7. Constraints as perceived by Agricultural officers.

4.1. Level of awareness, attitude, knowledge and extent of adoption of recommended practices by the beneficiaries and non-beneficiaries of three selected coconut development programmes

4.1.1. Beneficiaries of Area Expansion Programme

4.1.1.1 Level of awareness about Coconut Developement Programmes

The distribution of beneficiary farmers according to their level of awareness about coconut development programme is given in table-2.

Table-2 Distribution of beneficiary farmers according to their level of awareness about coconut development programmes.

Respondents n = 40	Category	Score range	Number	Percentage
Beneficiaries of Area Expansion Programme	High	≥29	23	57.50
	Low	<29	17	42.50

From the table-2 it could be seen that more than half of the farmers (57.50) per cent belonged to high awareness category and remaining (42.50 per cent) belonged to low awareness category.

4.1.1.2. Attitude towards Area Expansion Programme

The distribution of farmers according to their attitude is shown in the Table-3.

Table-3 Distribution of beneficiary farmers, according to their level of attitude towards Area Expansion Programme.

Respondents n=40	Category	Score range	Number	Percentage
Beneficiaries of Area Expansion Programme	Favourable	⩾36	24	60.00
	Unfavourable	<36	16	40.00

The data presented in the Table-3 revealed that majority of the beneficiary farmers were having favourable attitude towards the Area Expansion Programme.

4.1.1.3. Level of Knowledge about recommended coconut farming practices.

The beneficiary farmerswere categorised into two groups viz, low and high, according to their level of knowledge about improved coconut farming practices.

Table-4 Distribution of beneficiary farmers according to their level of knowledge about recommended coconut farming practices.

Respondent (n. 40)	Category	Score range	Number	Percentage
Beneficiaries of Area Expansion programme	High	≥10	22	55.00
	Low	<10	18	45.00

The data presented in the Table-4 revealed that more than half of the farmers (55.00 per cent) were having high level of knowledge about improved coconut farming practices.

4.1.1.4. Extent of Adoption of recommended coconut farming practices.

The beneficiary farmers were categorised into two groups viz, low and high according to their extent of adoption.

Table-5 Distribution of beneficiary farmers, according to their extent of adoption of recommended coconut farming practices.

Respondent (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Area Expansion Programme	High	≥71	18	45.00
	Low	<71	22	55.00

From the Table-5 it could be seen that more than half of the beneficiaries (55.00 per cent) belonged to low level of extent of adoption category, while 45.00 per cent of the beneficiaries belonged to high level of adoption category.

4.1.2. Beneficiaries of Irrigation programme

4.1.2.1. Level of Awareness about Coconut Development Programmes.

Beneficiary farmers were distributed in two levels viz, low and high level of awareness.

Table-6 Distribution of beneficiary farmers according to their level of awareness about coconut development programme.

Respondent (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Irrigation Programme	High	≥29	25	62.50
	Low	<29	15	37.50

It could be seen from Table-6 that majority (62.50 percent) of beneficiary farmers had high level of awareness about coconut development programmes whereas the rest of the respondents had low level of awareness about Coconut Development Programmes (37.50 percent).

4.1.2.2 Attitude towards Irrigation Programme

The distribution of beneficiary farmers according to their attitude towards irrigation scheme is given in the Table-7.

Table-7 Distribution of beneficiary farmers according to their level of attitude towards the irrigation scheme.

Respondent (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Irrigation Programme	Favourable	≥35	25	62.50
	Unfavourable	<35	15	37.50

From Table-7 it could be seen that majority (62.5 percent) of the beneficiaries of irrigation programme were having favourable attitude category, while 37.50 percent of the beneficiaries were having unfavourable attitude.

4.1.2.3. Level of knowledge about recommonded coconut farming practices

Beneficiary farmers were distributed into two categories viz, low and high level of knowledge.

Table-8 Distribution of beneficiaries according to their level of knowledge about recommended coconut farming practices.

Respondent (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Irrigation programme	High	≥9	21	52.50
	Low	<9	19	47.50

The data in the Table-8 revealed that, more than half of the farmers (52.50 per cent) belonged to high level of knowledge category while the rest (47.50 per cent) belonged to low knowledge category.

4.1.2.4. Extent of adoption of recommended coconut farming practices.

Beneficiary farmers were distributed into two categories viz, low and high based on their extent of adoption.

Table-9 Distribution of beneficiary farmers according to their extent of adoption under irrigation programme.

Respondent (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Irrigation Programme	High	≥69	18	45.00
	Low	<69	22	55.00

From the Table-9 it could be seen that more than half of the beneficiaries (55.00 per cent) belonged to the low adoption category.

4.1.3 Beneficiaries of Integrated Farming Programme

4.1.3.1 Level of awareness about Coconut Development Programmes

Beneficiary farmers were distributed into two level viz, low and high based on their level of awareness.

Table-10 Distribution of beneficiary farmers according to their level of awareness about coconut development programmes.

Respondent (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Integrated Farming Programme	High	≥29	23	57.50
	Low	<29	17	42.50

From the Table-10 it could be seen that more than half of the beneficiaries of Integrated farming programme (57.50 percent) belonged to high awareness category while 42.50 percent belonged to the low awareness category.

4.1.3.2. Attitude towards Integrated Farming Programme.

The distribution of farmers according to their attitude toward Integrated Farming Programme is shown in the Table-11

Table-11 Distribution of beneficiary farmers, according to their attitude towards Integrated farming programme.

Respondents (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Integrated farming programme:	Favourable	≥34	21	52.50
	Unfavourable	<34	19	47.50

From the Table-11 it could be seen that more than half of the beneficiaries of irrigation programme (52.50 percent) were having favourable attitude towards the programme, while less than half of the beneficiaries (47.50) per cent belonged to the unfavourable attitude category.

4.1.3.3. Level of Knowledge about recommended coconut farming practices.

Beneficiary farmers were distributed into two categories viz, low and high level of knowledge.

Table-12 Distribution of beneficiary farmers, according to their level of knowledge

Respondents (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Integrated Farming Programme	High	≥9	21	52.50
	Low	<9	19	47.50

From the Table-12 it could be seen that more than half of the beneficiaries (52.50 perrcent) belonged to high level of knowledge category.

4.1.3.4. Extent of Adoption of recommended coconut farming practices.

The distribution of the beneficiary farmers according to their adoption of recommended practices is furnished in Table-13.

Table-13 Distribution of beneficiary farmers according to their adoption of recommended practices.

Respondents (n=40)	Category	Score range	Number	Percentage
Beneficiaries of Integrated Farming Programme	High	≥67	16	40.00
	Low	<67	24	60.00

From the Table-13 it could be seen that only 40.00 per cent of of the beneficiary farmers were in high adoption category while the remaining 60.00 per cent of farmers belonged to the low level of adoption category.

4.1.4. Non-beneficiary farmers of coconut development programmes

4.1.4.1. Level of Awareness about Coconut Development Programmes.

The non-beneficiary farmers selected for the study, were classified under two groups viz, low and high, based on their level of awareness about coconut development programmes.

Table-14 Distribution of non-beneficiary farmers according to their level of awareness.

Respondents (n=60)	Category	Score range	Number	Percentage
Non-beneficiaries	High	≥23	34	56.66
	Low	<23	26	43.33

The data in Table-14 revealed that more than half of the non-beneficiary farmers (56.66 per cent) had high level of awareness about coconut development programmes, while the remaining 43.33 per cent belonged to low awareness category.

4.1.4.2. Attitude towards Coconut Development Programmes.

Non-beneficiary farmers, based on the level of attitude towards coconut development programmes were categorised into two groups viz.farmers having favourable and unfavourable attitude.

Table-15 Distribution of non-beneficiary farmers, according to their level of attitude towards coconut development programmes.

Respondents (n=60)	Category	Score range	Number	Percentage
Non-beneficiaries	Favourable	≥25	34	56.66
	Unfavourable	<25	26	43.33

From the Table-15 it could be seen that more than half of the non-beneficiaries (56.66 per cent) were having favourable attitude towards the programmes while the the rest of the non-beneficiaries (43.33 per cent) were having the unfavourable attitude.

4.1.4.3. Level of Knowledge about recommended coconut farming practices.

Beneficiary farmers were grouped into two categories viz, low and high based on their level of knowledge.

Table-16 Distribution of non-beneficiary farmers, according to their level of knowledge about recommended practices.

Respondents (n=60)	Category	Score range	Number	Percentage
Non-beneficiaries	High	≥6	28	46.67
	Low	<6	32	53.33

From the Table-16 it could be seen that more than half of the non-beneficiaries (53.33 per cent) belonged to low level of knowledge category and the remaining 46.67 per cent belonged to high level of knowledge category.

4.1.4.4. Extent of adoption of recommended coconut farming practices.

The distribution of the non-beneficiary farmers according to their adoption of recommended practices is furnished in Table-17

Table-17 Distribution of non-beneficiary farmers according to their adoption of recommended practices.

Respondents (n=60)	Category	Score range	Number	Percentage
Non-beneficiaries	High	≥40	26	43.33
	Low	<40	34	56.67

It could be seen from Table-17 that majority of (56.67 per cent) of non-beneficiary farmers belonged to be low level in extent of adoption, and while 43.33 per cent of the farmers belonged to high level of adoption category.

4.1.5 Practice wise adoption of beneficiary and non-beneficiary farmers

Table-18 Extent of adoption of individual practices by the beneficiary and non-beneficiary farmers

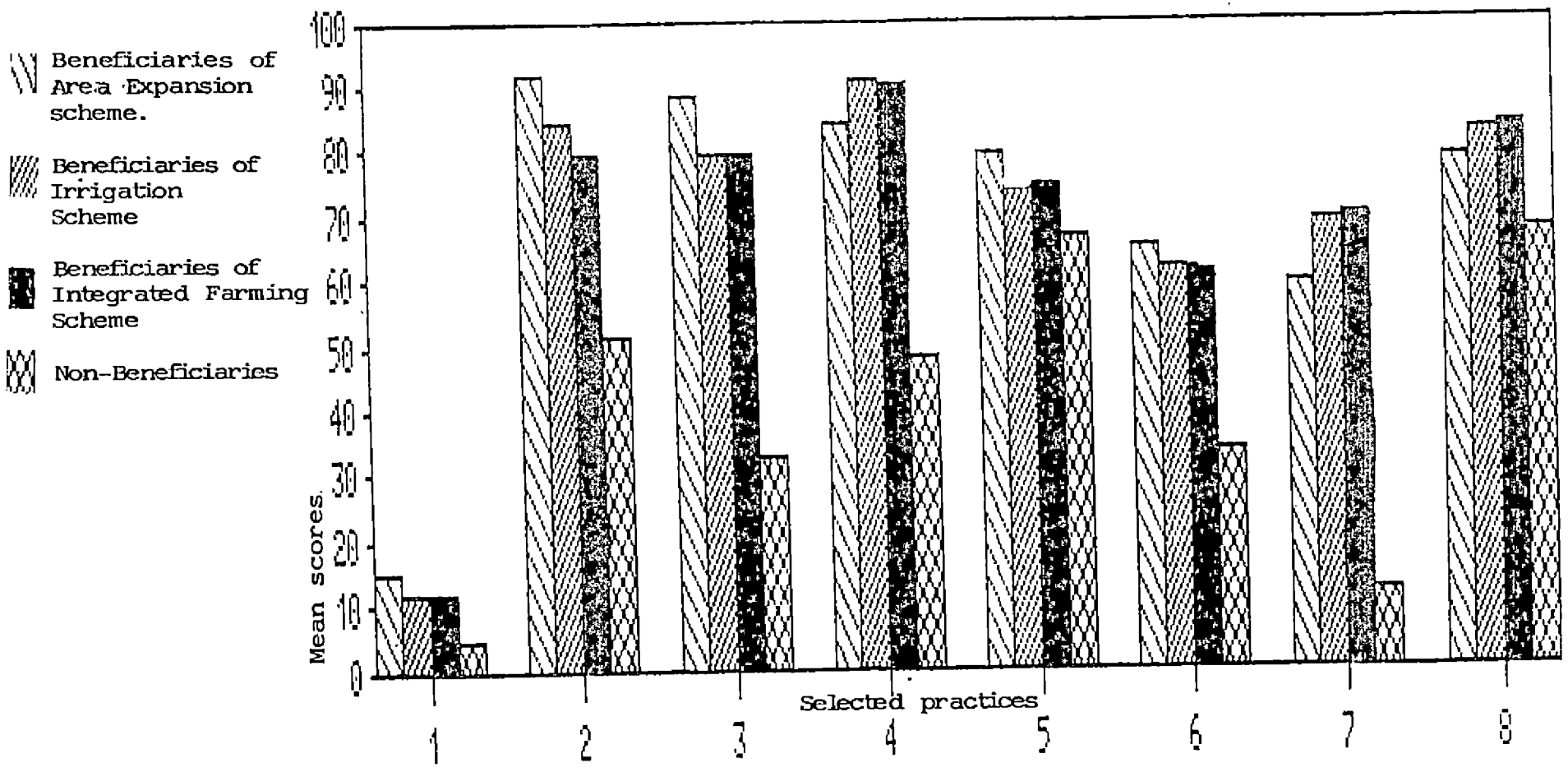
Sl.No.	Practices	Mean adoption scores			
		Beneficiaries			Non-Beneficiaries
		I	II	III	
1	Variety	15.00	12.00	12.00	5.00
2.	Filling the pits with top soil	93.00	82.00	80.00	52.00
3.	Spacing	90.00	80.00	80.00	33.00
4.	Irrigation	85.00	90.00	89.00	47.00
5.	Manuring	80.00	74.00	74.00	67.00
6.	Fertilizer application	65.00	62.00	61.00	34.00
7.	Application of plant protection chemicals	60.00	69.00	70.00	12.00
8.	Inter/Mixed cropping	79.00	83.00	84.00	68.00

I. Area expansion programme

II. Irrigation programme

III. Integrated farming programme

Fig. 2 Mean scores of the beneficiary and non-beneficiary farmers with respect to adoption of each recommended practices.



1. Variety
2. Filling the pits with top soil
3. Spacing
4. Irrigation
5. Manuring
6. Fertilizer application
7. Plant protection measures
8. Inter/Mixed cropping.

The results shown in Table-18 and figure 2 indicate that the mean adoption score of the beneficiary farmers of the three selected coconut development programmes were higher than that of the non beneficiary farmers.

A comparison between mean scores on the adoption of each practice by the beneficiary farmers of the three selected programmes revealed that extent of adoption of the practice, use of hybrid verities of seedlings for new planting, was very low in both the category of respondents. High level of adoption was noticed in the case of beneficiary farmers regarding other practices viz., filling the pits with top soil while planting, spacing, Irrigation, Manuring and Inter/Mixed cropping. (adoption score ranges from 79 to 93). Filling the pits with top soil while planting coconut was secured the highest adoption score (93.00) by the beneficiaries of the Area expansion programme. Irrigation practice was secured the highest adoption score (90.00 and 89.00) in the case of beneficiaries of Irrigation programme and Integrated Farming Programme. In the case of non-beneficiaries raising inter/mixed crops in coconut garden, and application of organic manures secured highest adapton score (68.00 and 67.00) respectively.

4.1.5.1. Adoption of individual practice by beneficiaries of Area Expansion Programme :

Table-18.1 **Frequency distribution of adopters based on their adoption score for each practice(Area Expansion Programme)** n=40

Adoption score	Variety	Filling the pits with top soil	Spacing	Irrigation	Manuring	Fertilizer	Plant protection	Inter/ mixed cropping
Non-adopters	24 (60%)	-	-	-	-	4 (10%)	5 (12.5%)	-
1-10	7 (17.5%)	-	-	-	-	-	-	3 (7.5%)
11-20	3 (7.5%)	-	1 (2.5%)	-	-	5 (12.5%)	-	2 (5.0%)
21-30	4 (10%)	-	2 (5.5%)	-	-	6 (15.0%)	8 (20.0%)	4 (10.0%)
31-40	2 (5.0%)	-	3 (7.5%)	2 (5.0%)	-	3 (7.5%)	8 (20.0%)	2 (5.0%)
41-50	-	2 (5.0%)	5 (12.5%)	4 (10.0%)	11 (27.5%)	3 (7.5%)	7 (17.5%)	4 (10.0%)
51-60	-	4 (10.0%)	3 (7.5%)	5 (12.5%)	4 (10.0%)	4 (10.0%)	8 (20.0%)	3 (7.5%)
61-70	-	4 (10.0%)	4 (10.0%)	6 (15.0%)	4 (10.0%)	8 (20.0%)	4 (10.0%)	5 (12.5%)
71-80	-	4 (10.0%)	7 (17.5%)	9 (22.5%)	10 (25.0%)	6 (15.0%)	-	8 (20.0%)
81-90	-	5 (12.5%)	4 (10.0%)	7 (17.5%)	4 (10.0%)	1 (2.5%)	-	6 (15.0%)
91-100	-	21 (52.5%)	21 (52.5%)	7 (17.5%)	7 (17.5%)	-	-	3 (7.5%)
Above100	-	-	-	-	-	-	-	-

A cursory view of the Table-18-1 shows that 60 per cent of the beneficiary farmers not adopted the practice use of high yielding hybrid coconut verities for new planting. Only 5 percent of farmers secured adoption score between 31 to 40. This indicates that, the adoption of this practice was very low. More than half of the beneficiary farmers (52.50 percent) secured adoption score between 91 to 100, on filling the pits with top soil while planting. Highest adoption score between (91-100) was secured by 52.50 per cent of beneficiaries on the adoption of correct spacing for new planting of coconut. In the case of adoption of irrigation practice, 17.50 per cent of farmers secured adoption score between 91 to 100, regarding the use of organic manures only 7 farmers (17.50 per cent) secured adoption score between the range of 91 to 100. Ten per cent of beneficiary farmers not adopted the use of chemical fertilizers and only one farmer secured adoption score between 81 to 90 and 15 per cent secured 71 to 80. None of the beneficiary farmers adopted application of fertilizers according to the recommendations. Regarding the use of plant protection chemicals also none of the farmers adopt the practice as per the recommendations, 12.50 per cent of beneficiary farmers not at all adopted the practice. High adoption score of 91 to 100, was secured by 7.50 percent of beneficiary farmers on raising, inter/mixed cropping. This indicates that only 7.50 per cent of the beneficiary farmers of area expansion programme made use of

the space available in the coconut garden for raising inter/mixed crops.

4.1.5.2. Adoption of individual paractices by beneficiaries of Irrigation programme.

A perusal of the data presented in Table 18.2 shows that 62.50 per cent of beneficiary farmers not used high yielding hybrid veritles of coconut seedlings for new planting. Only 7.50 per cent of farmers secured adoption score between 31 to 40. This showed that the extent of adoption of hybrid varieties is very low. High level of adoption on filling the pits with top soil while planting was practised by 17.50 per cent of beneficiary farmers. Only 2.5 per cent of farmers adopted correct spacing for new planting. Majority of farmers adopted 51 to 80 per cent of the recommended spacing. More than half of the beneficiaries (52.50 per cent) adopted irrigation practice in their coconut garden. All the beneficiary farmers irrigated 61 to 100 per cent of their palms during summer months. Only 20 per cent of farmers secured adoption score between 91 to 100, but majority of beneficiary farmers secured adoption score between 61 to 90. Twelve and a half per cent of the beneficiary farmers not adopted chemical fertilizers in their coconut gardens, and none of them apply fertilizers according to recommendations. Majority of farmers secured

Table-18.2 **Frequency distribution of adopters based on their adoption score for each practice (Irrigation Programme)** n=40

Adoption score	Variety	Filling the pits with top soil	Spacing	Irrigation	Manuring	Fertilizer	Plant protection	Inter/ mixed cropping
Non-adopters	25 (62.5%)	-	-	-	-	5 (12.5%)	8 (20.0%)	-
1-10	8 (20.0%)	-	-	-	-	-	-	5 (12.5%)
11-20	2 (5.0%)	-	-	-	-	5 (12.5%)	5 (12.5%)	2 (5.0%)
21-30	2 (5.0%)	2 (5.0%)	-	-	-	4 (10.0%)	-	6 (15.0%)
31-40	3 (7.5%)	2 (5.0%)	4 (10.0%)	-	2 (5.0%)	4 (10.0%)	-	4 (10.0%)
41-50	-	8 (20.0%)	6 (15.0%)	-	5 (12.5%)	9 (22.5%)	6 (15.0%)	8 (20.0%)
51-60	-	-	4 (10.0%)	-	3 (7.5%)	10 (25.0%)	3 (7.5%)	2 (5.0%)
61-70	-	-	6 (15.0%)	3 (7.5%)	7 (17.5%)	2 (5.0%)	14 (35.0%)	9 (22.5%)
71-80	-	12 (30.0%)	15 (37.5%)	4 (10.0%)	12 (30.0%)	1 (2.5%)	4 (10.0%)	2 (5.0%)
81-90	-	9 (22.5%)	4 (10.0%)	12 (30.0%)	3 (7.5%)	-	-	2 (5.0%)
91-100	-	7 (17.5%)	1 (2.5%)	21 (52.5%)	8 (20.0%)	-	-	-
Above100	-	-	-	-	-	-	-	-

adoption score between the range 41 to 70, which shows that more than 50 per cent of beneficiaries adopted 41 to 70 per cent of the recommended doze of fertilizers in their coconut gardens. Adoption of plant protection measures against pests and disease was not done by 20 per cent of beneficiary farmers. Majority of the farmers secured adoption score between 41 to 70 and none of the farmers adopted the practice as per the recommendations. Only 5.00 per cent of farmer secured high adoption score, between 91 to 100, on raising inter/mixed crops, and majority of farmers secured adoption score between 41 to 70. This indicated that only 41 to 70 per cent of the area available in the coconut garden is utilized for raising inter/mixed crops by majority of coconut growers.

4.1.5.3 Adotpion of individual practices by beneficiary farmers of Integrated farming programme.

The data presented in Table 18.3 shows that majority of beneficiary farmers (65.00 per cent) not adopted the practice, use of hybrid coconut seedlings for new planting. This indicates that adoption of this practice was very low. Highest adoption score of 91 to 100 was secured by 7.50 per cent of beneficiary farmers, on the adoption of filling the pits with top soil while planting, and majority of them secured adoption score between the range 61 to 90. Only

Table-18.3 **Frequency distribution of adopters based on their adoption score for each practice (Integrated Farming Programme)** n=40

Adoption score	Variety	Filling the pits with top soil	Spacing	Irrigation	Manuring	Fertilizer	Plant protection	Inter/ mixed cropping
Non-adopters	26 (65.0%)	-	-	-	-	4 (10.0%)	-	-
1-10	9 (22.5%)	-	-	-	-	-	-	-
11-20	2 (5.0%)	-	-	-	-	5 (12.5%)	10 (20.0%)	4 (10.0%)
21-30	2 (5.0%)	3 (7.5%)	-	-	-	4 (10.0%)	4 (10.0%)	6 (15.0%)
31-40	1 (2.5%)	1 (2.5%)	4 (10.0%)	4 (10.0%)	3 (7.5)	5 (12.5%)	-	5 (12.5%)
41-50	-	4 (10.0%)	6 (15.0%)	3 (7.5%)	5 (12.5%)	9 (22.5%)	4 (10.0%)	6 (15.0%)
51-60	-	2 (5.0%)	6 (15.0%)	4 (10.0%)	3 (7.5%)	10 (25.0%)	5 (12.5%)	4 (10.0%)
61-70	-	5 (12.5%)	5 (12.5%)	6 (15.0%)	6 (15.0%)	1 (2.5%)	13 (32.5%)	8 (20.0%)
71-80	-	14 (35.0%)	15 (37.5%)	7 (17.0%)	13 (32.5%)	2 (5.0%)	2 (5.0%)	3 (7.5%)
81-90	-	8 (20.0%)	3 (7.5%)	4 (10.0%)	4 (10.0%)	-	1 (2.5%)	2 (5.0%)
91-100	-	3 (7.5%)	1 (2.5%)	12 (30.0%)	6 (15.0%)	-	1 (2.5%)	2 (5.0%)
Above100	-	-	-	-	-	-	-	-

2.50 per cent of the beneficiary farmers secured high adoption score of 91 to 100, for providing correct spacing while planting. More than 50 per cent of them secured adoption score between 51 to 80, which shows that, majority of the beneficiary farmers providing 51 to 80 per cent of the recommended spacing for new planting coconut. For irrigation practice, highest adoption score of 91-100 was secured by 30 per cent of beneficiary farmers. Regarding application of organic manuers highest adoption score of 91 to 100 was secured by only 15 percentage of beneficiary farmers. More than fifty percentage of them secured adoption score between 61 to 90. This shows that majority of beneficiary farmers adopted 61 to 90 per cent of the recommended doze of organic manuers. While none of beneficiary farmers applied fertilizers according to the recommendation, and 10 per cent of them not adopted the practice. Highest adoption score of 71 to 80 was secured by only 5.00 per cent of beneficiaries and majority of t hem secured adoption score between the range 31 to 60, which shows that majority of beneficiary farmers applied only 31 to 60 per cent of the recommended doze of fertilizers. Higher level of adoption of plant protection measures was shown by below 10 per cent of the respondents only, majority of beneficiary farmers secured adoption score between 41 to 70. Only 5 per cent of farmers secured high adoption score, between 91 to 100, on raising inter/mixed crops in coconut

Table-18.4 **Frequency distribution of adopters based on their adoption score for each practice (Non-beneficiaries)** n=60

Adoption score	Variety	Filling the pits with top soil	Spacing	Irrigation	Manuring	Fertilizer	Plant protection	Inter/ mixed cropping
Non-adopters	44 (73.3%)	6 (10.0%)	-	12 (20.0%)	-	12 (20.0%)	33 (55.0%)	-
1-10	12 (20.0%)	4 (6.6%)	-	6 (10.0%)	3 (5.0%)	-	-	6 (10.0%)
11-20	3 (5.0%)	3 (5.0%)	-	9 (15.0%)	3 (5.0%)	5 (8.3%)	9 (15.0%)	5 (8.3 %)
21-30	1 (1.7%)	3 (5.0%)	10 (16.7%)	12 (20.0%)	5 (8.3%)	7 (11.7%)	-	7 (11.7%)
31-40	-	6 (10.0%)	5 (8.3%)	7 (11.7%)	4 (6.7%)	12 (20.0%)	12 (20.0%)	9 (15.0%)
41-50	-	29 (48.3%)	17 (28.3%)	14 (23.3%)	8 (13.3%)	9 (15.0%)	6 (10.0%)	12 (20.0%)
51-60	-	6 (10.0%)	9 (15.0%)	-	10 (16.7%)	9 (15.0%)	-	15 (25.0%)
61-70	-	3 (5.0%)	12 (20.0%)	-	24 (40.0%)	3 (5.0%)	-	6 (10.0%)
71-80	-	-	7 (11.7%)	-	3 (5.0%)	3 (5.0%)	-	-
81-90	-	-	-	-	-	-	-	-
91-100	-	-	-	-	-	-	-	-
Above100	-	-	-	-	-	-	-	-

garden. Sizeable farmers secured adoption score between 31 to 70, which indicate that majority of farmers adopt 31 to 70 per cent of the total area available int he coconut garden for raising inter/mixed crops.

4.1.5.4 Adoption of individual practices by non-beneficiaries.

The result shown in Table 18.4 shows that majority (77.33 per cent) of non-beneficiary farmers not adopted use of hybrid varieties of coconut seedlings for new planting, which shows that the extent of adoption of this practice is very low. None of the farmers adopted filling half of the pit with top soil, while planting. Ten per cent of farmers did not adopt the practice. None of farmers adopt the correct spacing for planting coconut. Irrigation practice was not adopted by 20 per cent of the non-beneficiaries, and maximum score between 31 to 40 was secured by only 23 to 34 per cent of the non-beneficiaries. Forty per cent of farmers secured adoption score between 61 to 70, while 20 per cent of them not apply fertilizers in their coconut garden. Maximum score for fertilizer application between (71 to 80) was secured by only 5 per cent of non-beneficiaries, which shows that the extent of adoption of fertilizers was also very low when compared to other practices. Out of 60 non-beneficiaries, 33 farmers (55.00 per cent) were not adopted application of plant

protection chemicals against pest and disease. and maximum score of between 41 to 50 was secured only 10 per cent of non-beneficiaries. None of the non-beneficiary farmer found to raise inter/mixed crops in the area available in coconut gardens. Maximum adoption score between 61 to 70 was secured by only 10 per cent of non-beneficiaries, which indicated that only 10 per cent of non-beneficiary farmers cover 61 to 70 per cent of the area available in coconut garden for raising inter/mixed crops.

4.2.Relationship of level of awareness, attitude,knowledge and extent ofadoption of beneficiary andnon-beneficiary farmers with their selected characteristics.

Correlation analysis was done to find outthe relationship oflevel of awareness, attitude, knowledge and extent of adoption by beneficiaries and non-beneficiaries with their selected characteristics under thestudy. Theresults are presented in Table 19-21.

4.2.1 Beneficiaries of Area Expansion Programme

The relationship between thelevel of awareness,attitude, knowledge and extent of adoption with selected characteristics, of beneficiaries of Area expansion

Table - 19 :Correlation between independent and dependent variables among beneficiaries of Area Expansion Programme.

S.No.	Independent variables	Dependent variables			
		Awareness	Attitude	Knowledge	Adoption
1	Farm size	-0.0924 NS	-0.1988 NS	0.0802 NS	0.0267 NS
2	Farming Experience	0.1777 NS	-0.0419 NS	0.0824 NS	0.1205 NS
3	Education	0.2379 NS	0.1299 NS	0.0668 NS	0.1200 NS
4	Social Participation	0.0198 NS	0.0417 NS	0.2035 NS	0.2172 NS
5	Economic Motivation	-0.0492 NS	0.4879 **	0.1042 NS	0.1381 NS
6	Extension Contact	0.2488 NS	-0.0090 NS	0.3898 *	0.5764 **
7	Mass media Exposure	0.4172 **	0.0236 NS	0.2028 NS	0.3395 *
8	Scientific Orientation	0.1132 NS	0.3483 *	0.1217 NS	0.4659 **

* Significant at 0.05 level: ** Significant at 0.01 level: NS- Not Significant.

programme were analyzed by computing the coefficient of correlations and the results were presented in Table-19

4.2.1.1 Relationship between awareness of beneficiary farmers about coconut development programmes and their selected charecterstics.

A perusal of the results presented in Table-19 revealed that level of awareness of beneficiary farmers of Area expansion Programme was positively and significantly related with massmedia exposure. All the other variables, viz. Farm size, Farming experience, Education, Social participation, Economic motivation, Extension contact and Scientific orientation were found to be not significantly related with level of awareness.

A critical observation of the table also revealed that mass media exposure, had the highest coefficient of correlation with awareness followed by extension contact.

4.2.1.2 Relationship between attitude of beneficiary farmers towards Area Expansion programme and their selected characteristics.

The data presented in Table-19 showed that characteristics of beneficiary farmer, such as, economic motivation and scientific orientation had positive and significant

relationship with the attitude towards Area Expansion Programme. All the other variables, viz. Farmsize, Farming experience, Education, Social participation, extension contact and mass media exposure were found to be not significantly related, with level of attitude.

It was further noticed that economic motivation of beneficiary farmers had highest correlation coefficient (0.4879) followed by scientific orientation (0.3483)

4.2.1.3. Relationship between knowledge of beneficiaries about recommended coconut farming practices and their selected characteristics.

According to the data presented in Table-19 it was also found that, extension contact was positively and significantly related to the level of knowledge of beneficiaries about recommended coconut farming practices. The remaining variables, viz, farmsize, farming experience, education, economic motivation, mass media exposure and social participation were found to have no significant relationship with knowledge.

A critical observation of the Table revealed that extension contact had highest correlation coefficient followed by social participation and mass media exposure.

4.2.1.4 Relationship between extent of adoption of recommended practices by the beneficiaries and their selected characteristics.

A perusal of the results presented in Table-19 revealed that extension contact, scientific orientation, and mass media exposure were positively and significantly related with the extent of adoption of recommended practices by the beneficiaries of Area expansion Programme. All the other variables, viz. farm size, farming experience education, social participation and economic motivation had no significant relationship with extent of adoption.

It was further observed that extension contact had the highest correlation coefficient, followed by scientific orientation, mass media exposure and social participation in the descending order.

4.2.2. Beneficiaries of Irrigation Programme

4.2.2.1. Relationship between awareness of beneficiary farmers about coconut development programmes and their selected characteristics.

The correlation coefficient (r) as shown in Table-20 indicated that social participation, extension contact and scientific orientation were positively and significantly correlated with the level of awareness of beneficiaries of Irrigation programme. All the other variables, farm size, farming experience, education, economic motivation and mass media exposure were not significantly related with the level of awareness

A critical observation of the data, showed that extension contact had the highest coefficient of correlation followed by social participation and scientific orientation.

4.2.2.2 Relationship between attitude of beneficiary farmers towards Irrigation programme and their selected characteristics.

From the data in Table-20 it could be seen that in the case of beneficiaries of irrigation programme, the farming

Table - 20 :Correlation between independent and dependent variables among beneficiaries of Irrigation programme.

S.No.	Independent variables	Dependent variables			
		Awareness	Attitude	Knowledge	Adoption
	Farm size	-0.1053 NS	-0.2104 NS	0.2338 NS	0.2771 NS
	Farming Experience	0.0959 NS	0.3084 *	0.4617 **	0.4613 **
	Education	0.0880 NS	- 0.1860 NS	0.2369 NS	0.2582NS
	Social Participation	0.3909 *	0.0634 NS	0.5130 **	0.4718 **
	Economic Motivation	-0.2313NS	0.0418 NS	-0.3505 **	-0.5423 **
	Extension Contact	0.3996 *	-0.1368 NS	0.7196 **	07238**
	Mass media Exposure	0.2212 NS	0.1982 NS	0.7666 **	0.8069 **
	Scientific Orientation	0.3302 *	0.2744 NS	0.6063 **	0.5369**

Significant at 0.05 level: ** Significant at 0.01 level: NS- Not Significant.

experience was positively and significantly related with attitude towards Irrigation programmes. All other variables were not significantly related with their attitude.

It was further observed that farming experience was found to have the highest correlation-coefficient followed by scientific orientation.

4.2.2.3 Relationship between knoledge of beneficiary farmers about recommended coconut farming practices and their selected characteristics.

The computed 'r' value as per the Table-20 revealed that, except farm size and education, all the other variables had positive and significant relationship with the level of knowledge of beneficiaries about recommended practices. Economic motivation was found to be negatively correlated with the level of knowledge.

It was further observed that mass media exposure was found to have the highest coefficient of correlation, followed by extension contact.

4.2.2.4 Relationship between extent of adoption of recommended practices by the beneficiary farmers and their selected characteristics.

The data presented in Table-20 revealed that except farm size, education and economic motivation all other variables had positive and significant relationship with extent of adoption. Economic-motivation was found to be negatively and significantly related with the extent of adoption of recommended practices by beneficiaries of irrigation programme.

As evident from the table, mass media exposure, had the highest coefficient of correlation followed by extension contact.

4.2.3 Beneficiaries of Integrated farming programme

4.2.3.1 Relationship between awareness to beneficiary farmers about coconut development programmes and their selected characteristics.

The computed `r' value as per Table-21 indicated that mass media exposure and scientific orientation were positively and significantly related with awareness of beneficiaries about coconut development programmes. All the other

Table - 21 :Correlation between independent and dependent variables among beneficiaries of Integrated Farming Programme

S.No.	Independent variables	Dependent variables			
		Awareness	Attitude	Knowledge	Adoption
1	Farm size	-0.1201 NS	0.0166 NS	0.1679 NS	-0.0045 NS
2	Farming Experience	0.2117 NS	0.3326 *	0.1571 NS	0.1392 NS
3	Education	0.1598 NS	- 0.1300 NS	0.4110 **	0.2228 NS
4	Social Participation	0.2556 NS	0..2585 NS	0.4222 **	0.4426 **
5	Economic Motivation	0.0253 NS	0.1076 NS	0.0762 NS	0.1282 NS
6	Extension Contact	0.2989 NS	0.2242 NS	0.7162 **	0.8173 **
7	Mass media Exposure	0.4247 **	0..2953 NS	0.5837 **	0.7055 **
8	Scientific Orientation	0.4504 **	0.4580 **	0.3183 *	0.2656 NS

* Significant at 0.05 level: ** Significant at 0.01 level: NS- Not Significant.

variables were not significantly related with their level of awareness.

It was further observed that scientific orientation had the highest correlation coefficient followed by mass media exposure.

4.2.3.2 Relationship between attitude of beneficiary farmers towards Integrated farming programme and their selected characteristics.

According to the data presented in Table-21 the relationship of attitude of beneficiary farmers towards Integrated farming programme was positively and significantly related with farming experience and scientific orientation. All the other variables were found to be significantly not related with their attitude.

It was further observed that scientific orientation had highest correlation coefficient followed by farming experience.

4.2.3.3 Relationship between knowledge of beneficiary farmers about recommended coconut farming practices and their selected characteristics.

The computed `r' value as per the Table-21 revealed that, except farm size, farming experience and economic

motivation, all the other variables had positive and significant relationship with level of knowledge of beneficiaries about recommended practices.

The table also showed that extension contact had the highest coefficient of correlation followed by mass media exposure.

4.2.3.4. Relationship between extent of adoption of recommended practices by the beneficiaries and their selected characteristics.

The data presented in the Table-21 revealed that social participation, extension contact and mass media exposure were positively and significantly related to the extent of adoption.

All the other characteristics of beneficiary farmers viz, farm size, farming experience, education and scientific orientation were not significantly related.

4.2.4 Non beneficiaries of Coconut Development Programmes.

4.2.4.1 Relationship between awareness of non- beneficiary farmers about coconut development programmes and their selected characteristics.

The correlation coefficient 'r' as shown in Table-22 revealed that level of awareness of non-beneficiary farmers were positively and significantly related with farming experience, social participation, extension contact, mass media exposure and scientific orientation. Education, farm size and economic motivation were not significantly related with level of awareness of non-beneficiary farmers.

4.2.4.2 Relationship between attitude of non-beneficiary farmers towards coconut development programmes and their selected characteristics.

The data presented in the Table-22 revealed that the selected variables had no significant relationship with attitude of non-beneficiary farmers towards coconut development programmes.

4.2.4.3 Relationship between knowledge of non-beneficiary farmers about recommended coconut farming practices and their selected characteristics.

A perusal of the results presented in Table-22 revealed that social participation, extension contact and mass media

Table - 22:Correlation between independent and dependent variables among Non-beneficiaries

S.No.	Independent variables	Dependent variables			
		Awareness	Attitude	Knowledge	Adoption
1	Farm size	0.2288 NS	-0.1348 NS	0.0153 NS	-0.0101 NS
2	Farming Experience	0.5486 **	0.0107 NS	0.1978 NS	0.2351 NS
3	Education	0.0838 NS	- 0.0869 NS	0.2789 NS	0.2418 NS
4	Social Participation	0.4324 **	0..2833 NS	0.7405 **	0.8513 **
5	Economic Motivation	0.1683 NS	-0.0577 NS	-0.2678 NS	-0.2723 NS
6	Extension Contact	0.3589 *	0.3019 NS	0.6531 **	0.7794 **
7	Mass media Exposure	0.5662**	0..2723 NS	0.6263 **	0.5951 **
8	Scientific Orientation	0.3699 *	-0.0111 NS	0.2098 NS	0.2187 NS

* Significant at 0.05 level: ** Significant at 0.01 level: NS- Not Significant.

FIG. 3. CORRELATION BETWEEN FARMER RESPONDENTS' CHARACTERISTICS AND AWARENESS ABOUT COCONUT DEVELOPMENT PROGRAMMES

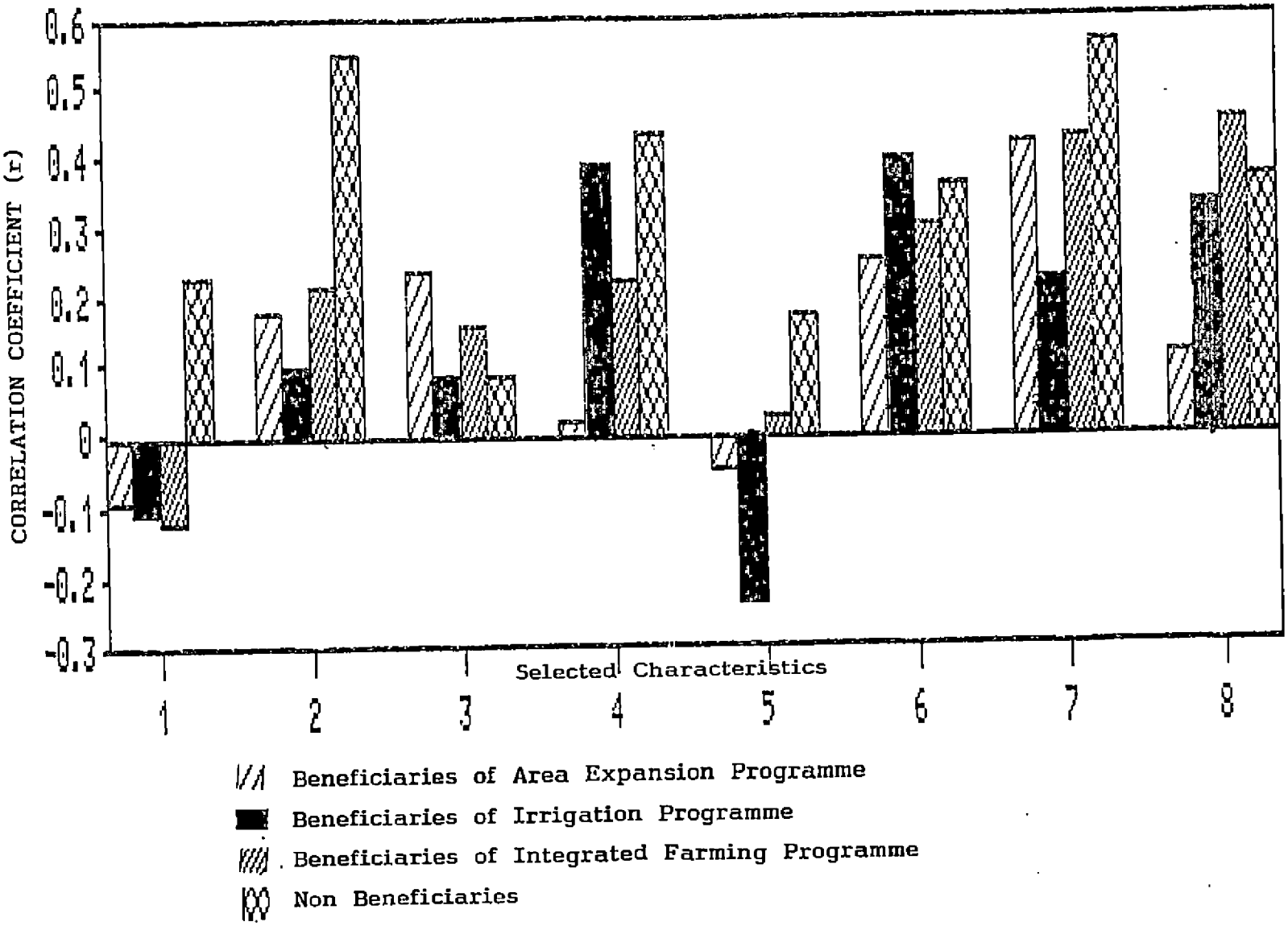


FIG. 4. CORRELATION BETWEEN FARMER RESPONDENTS' CHARACTERISTICS AND ATTITUDE TOWARDS COCONUT DEVELOPMENT PROGRAMMES

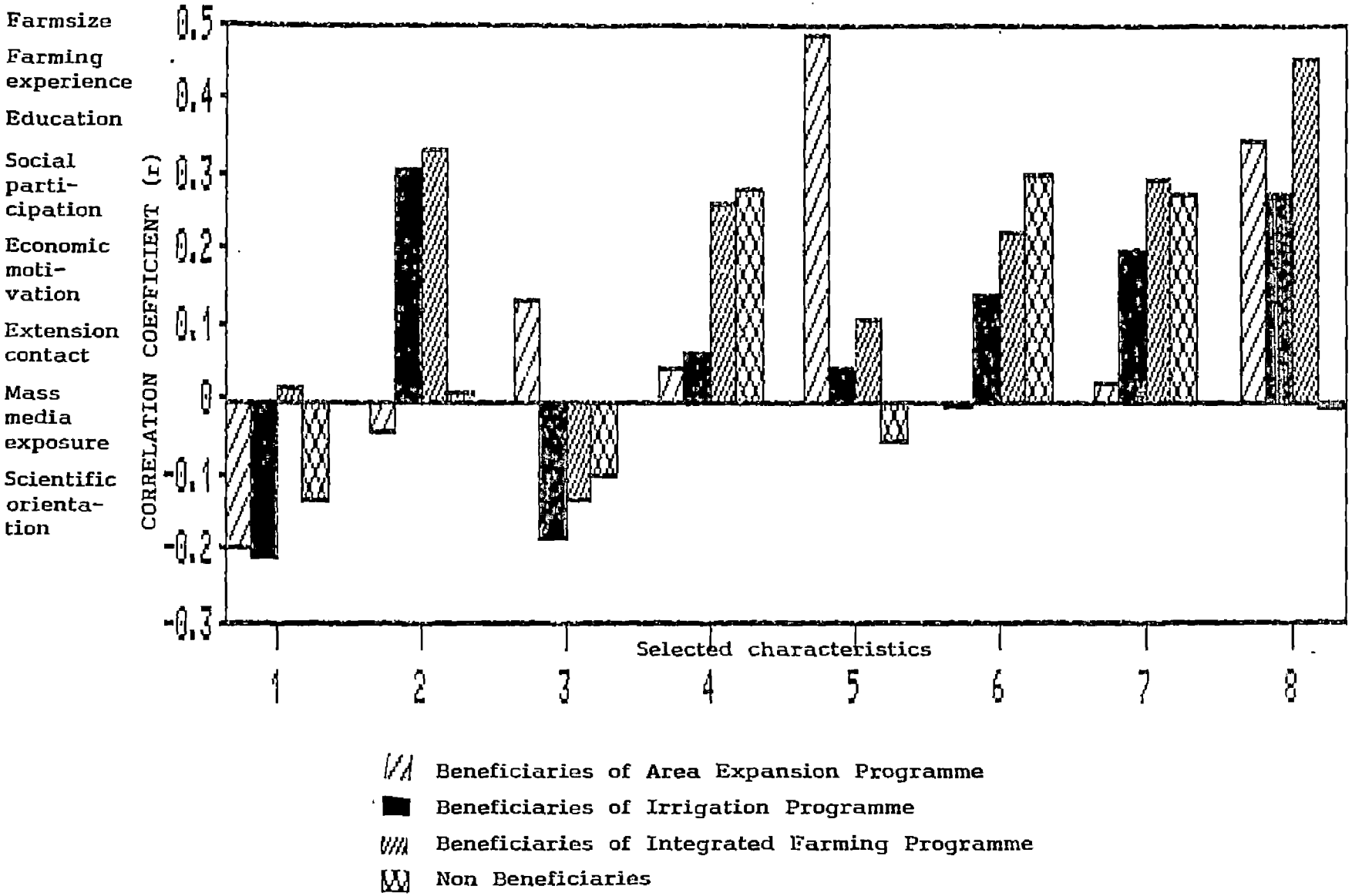


FIG. 5. CORRELATION BETWEEN FARMER RESPONDENTS' CHARACTERISTICS AND AND KNOWLEDGE ABOUT RECOMMENDED PRACTICES

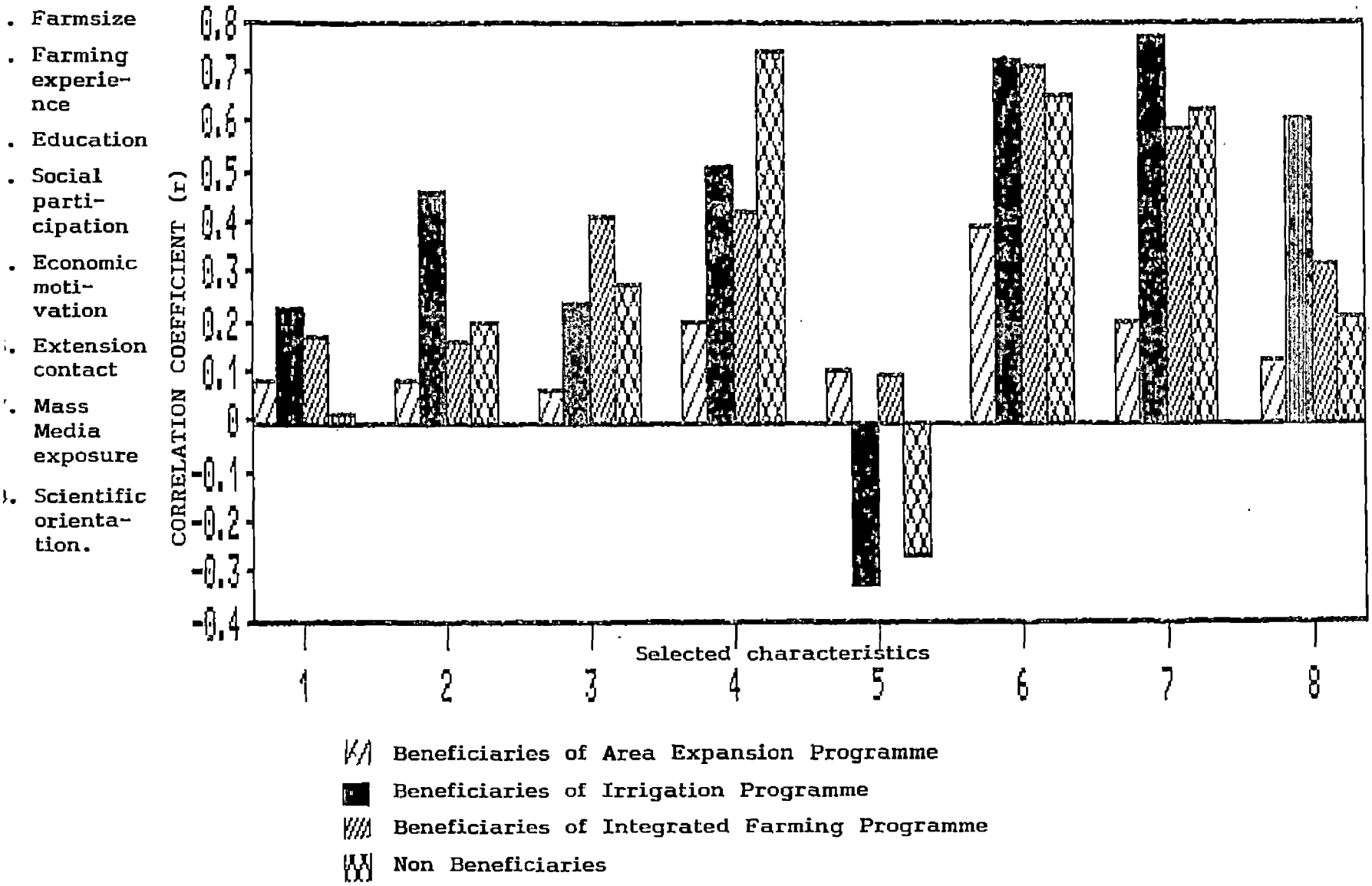
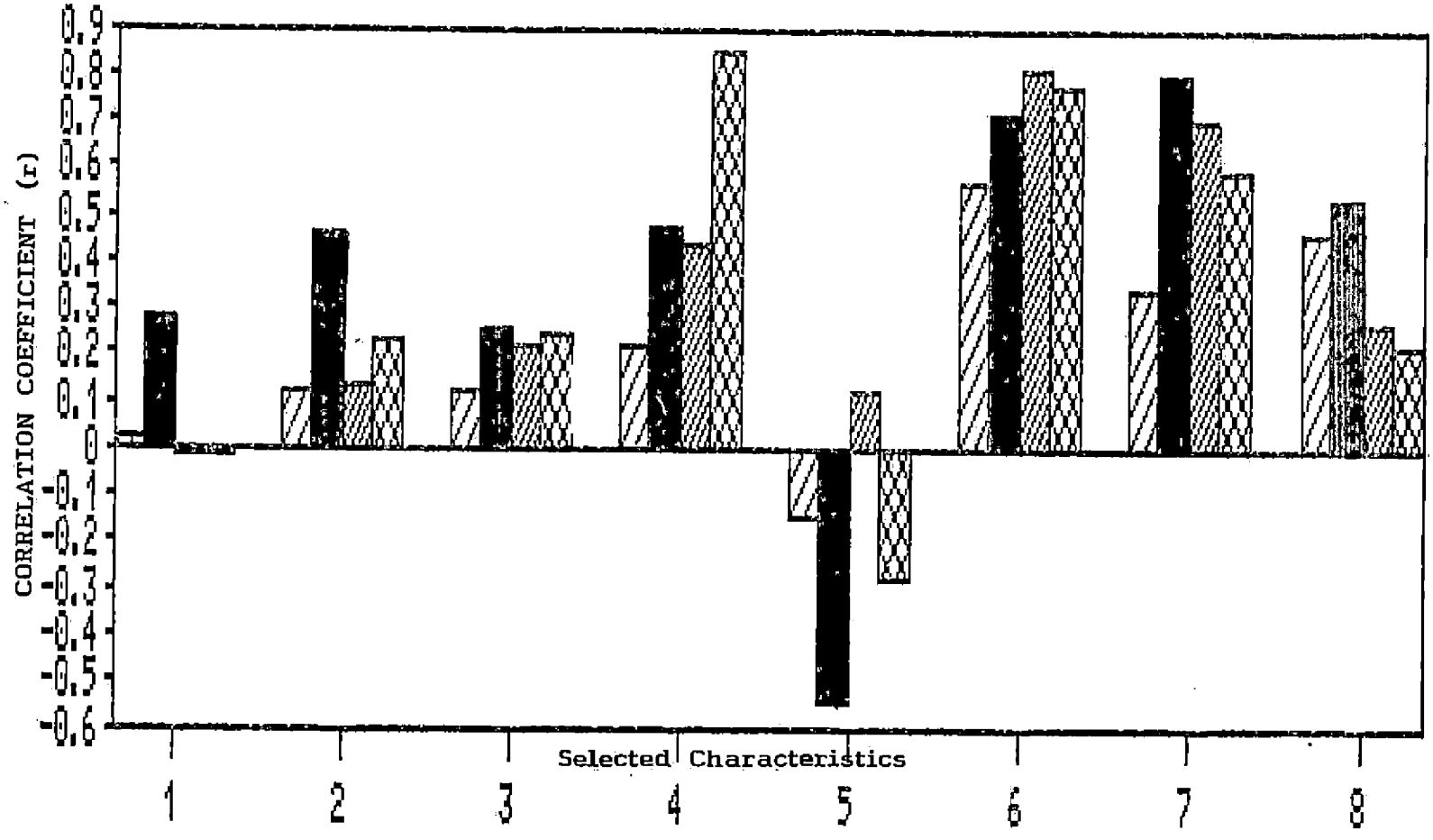


FIG. 6.. CORRELATION BETWEEN FARMER RESPONDENTS' CHARACTERISTICS AND ADOPTION OF RECOMMENDED PRACTICES

1. Farmsize
2. Farming experience
3. Education
4. Social participation
5. Economic motivation
6. Extension contact
7. Mass Media exposure
8. Scientific orientation



Beneficiaries of Area Expansin Programme

Beneficiaries of Irrigation Programme

Beneficiaries of Integrated Farming Programme

Non beneficiaries

exposure were positively and significantly related with the level of knowledge of non-beneficiary farmers about recommended coconut farming practices. Other variables had no significant relationship with level of knowledge of non-beneficiary farmers.

4.2.4.4 Relationship between adoption of recommended practices by non-beneficiary farmers and their selected characteristics.

The data presented in the Table-22 revealed that social participation, extension contact and mass media exposure were positively and significantly related with the extent of adoption. All the other characteristics of non-beneficiary farmers were not significantly related with extent of adoption of recommended coconut farming practices.

4.3 Interrelationship of level of awareness, attitude, knowledge and extent of adoption of farmer respondents.

The inter relationship of the four dependent variables were studied. The results of the study are presented in the tables.

The Tables-23, 24, 25 and 26 showed the inter relationship between awareness, attitude, knowledge and extent of adoption of the beneficiary farmers of Area expansion programme, Irrigation programme, Integrated farming programme and in the case of non-beneficiaries of coconut development programmes respectively.

Table-23 Intercorrelation of dependent variables (Area Expansion Programme.)

	Awareness	Attitude	Knowledge	Adoption
Awareness	-	0.5500**	0.4390**	0.3663*
Attitude	-	-	0.3808*	0.3740*
Knowledge	-	-	-	0.6703**
Adoption	-	-	-	-

Table-24 Intercorrelation of dependent variable (Irrigation programme)

	Awareness	Attitude	Knowledge	Adoption
Awareness	-	0.3809*	0.3201*	0.3990*
Attitude	-	-	0.3693*	0.3638*
Knowledge	-	-	-	0.9252**
Adoption	-	-	-	-

Table-25 Intercorrelation of dependent variable (Integrated farming programme)

	Awareness	Attitude	Knowledge	Adoption
Awareness	-	0.3275*	0.4141**	0.5338**
Attitude	-	-	0.3806*	0.3704*
Knowledge	-	-	-	0.8256**
Adoption	-	-	-	-

Table-26 Intercorrelation of dependent variable (Non-beneficiaries)

	Awareness	Attitude	Knowledge	Adoption
Awareness	-	0.5406**	0.4922**	0.4753**
Attitude	-	-	0.4749**	0.4984**
Knowledge	-	-	-	0.8554**
Adoption	-	-	-	-

* significant at 0.1 level ** significant at 0.05 level

In all the cases, it was found the relationship of the four variables viz, awareness, attitude, knowledge and adoption were positively and significantly correlated with each other.

4.4 Comparison of beneficiaries of the three selected development programme according to their level of awareness, attitude, knowledge and extent of adoption

The Kruskal-Wallis test was employed to compare the beneficiaries of 3 selected development programmes. Forty observations of the 3 group of farmers were taken, to test the significance.

Table-27 Rank values of the beneficiaries of the three selected Coconut Development Programmes:

Dependent variable	Rank values of beneficiaries			
	Area expansion programme	Irrigation programme	Integrated farming programme	chi-Sqr. Value
Awareness	60	71	62	3.91 NS
Attitude	64	65	53	3.15 NS
Knowledge	70	59	52	5.89 NS
Adoption	75	50	56	10.87*

* significant at 5 per cent level. N.S. Not Significant

Fig. 7 Rank Values of Beneficiaries

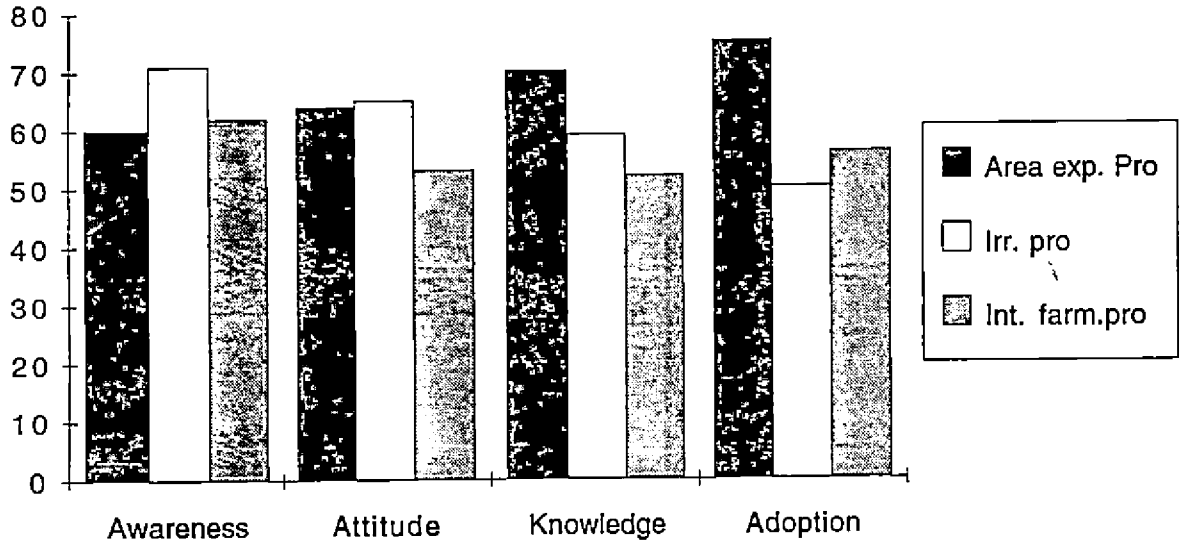


Table-27 shows the results of the Kruskal-Wallis test employed to test the significance of difference between the awareness, attitude, knowledge and adoption of the beneficiaries of three coconut development programmes.

4.4.1 Level of awareness about coconut development programmes

According to Table-27 it was found that chi-square value calculated for awareness was 3.91 which is not significant at 5 per cent level of probability. Hence, it is clear that the three categories of respondents did not differ significantly in their level of awareness about coconut development programmes. It would also be noticed that the beneficiaries of Irrigation programme had high level of awareness about coconut development programmes than beneficiaries of Area expansion and Integrated farming programme.

4.4.2 Attitude towar
programmes.

The data presented in Table-27 revealed that chi-square value of attitude was 3.15 which is also not significant at 5 per cent level of probability. This indicated that the beneficiaries of the three selected coconut development programmes did not differ significantly with respect to

their level of attitude towards the selected programmes. It could also be noticed that beneficiaries of irrigation programme had better attitude towards the programme than beneficiaries of other two programmes.

4.4.3 Level of knowledge about recommended coconut farming practices.

According to the data presented in Table-27 it was found that chi-square value calculated for knowledge was 5.89 which is also not significant at 5 per cent level of probability. This showed that the beneficiaries of the three selected coconut development programmes did not differ significantly with respect to their level of knowledge about improved coconut farming practices recommended through these development programmes. It could also be noticed that the beneficiaries of Area expansion programme had high level of knowledge about recommended practices than beneficiaries of the other two programmes.

4.4.4 Extent of adoption of recommended coconut farming practices.

The data presented in Table-27 shows that chi-square value for adoption was 10.87, which is significant at 5 per cent level of probability. This indicated that beneficiaries of

the three selected coconut development programme differ significantly with their extent of adoption of recommended coconut farming practices. From the rank values, it could be seen that the extent of adoption of recommended practices was high, in the case of beneficiaries of Area expansion programme compared to other two programmes. There is not much difference between the extent of adoption of recommended practices by the beneficiaries of Irrigation and Integrated farming programmes.

4.5. Comparison of beneficiaries and non-beneficiaries according to their level of awareness, attitude, knowledge and extent of adoption

A comparison of beneficiaries of three selected coconut development programmes and non-beneficiary farmers, on the level of awareness, attitude, knowledge and extent of adoption of recommended coconut farming practices; is presented in the Tables-28,29 and 30.

4.5.1 Area Expansion programme

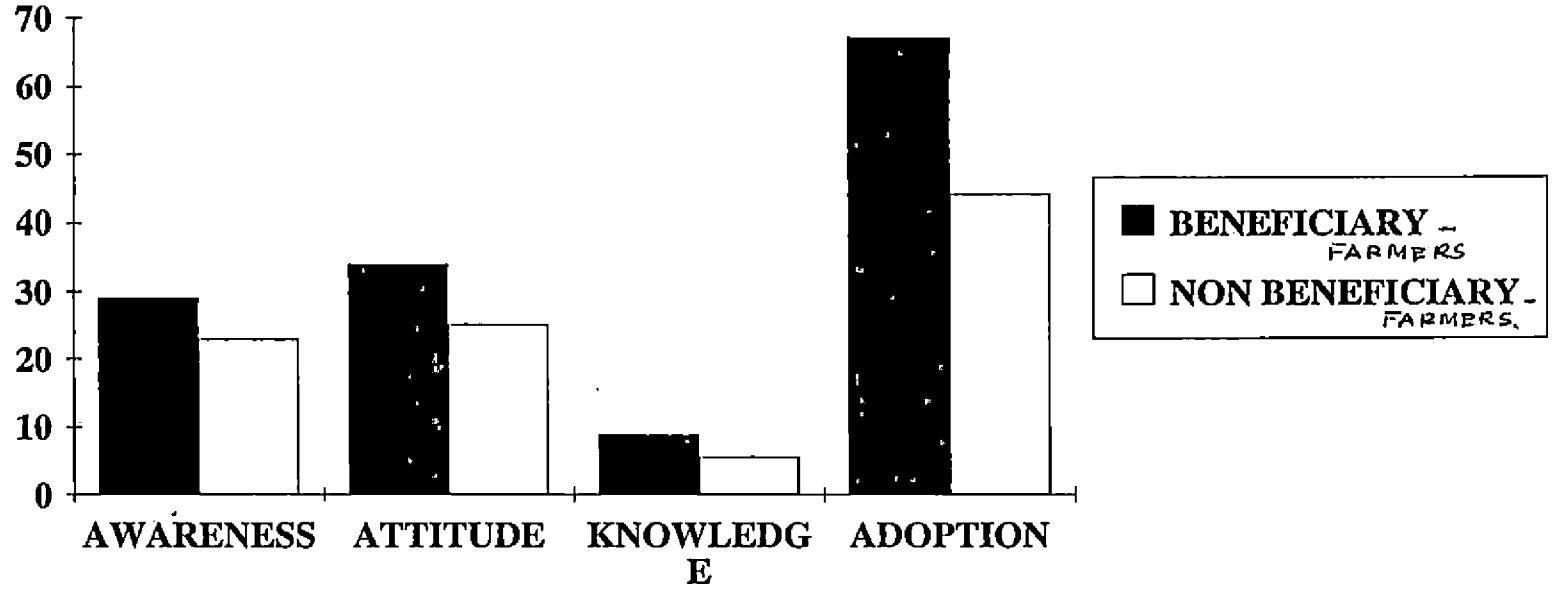
Table-28 Mean scores of beneficiary and non-beneficiary farmers on the level of awareness, attitude, knowledge and extent of adoption(Area expansion programme)

Sl.No.	Characteristics	Mean scores of		
		Beneficiary farmers n=40	Non-Beneficiary farmers n=60	Z-value
1	Awareness	28.575	22.966	7.7149**
2	Attitude	35.500	25.166	8.2707**
3	Knowledge	9.800	5.616	7.8310**
4	Adoption	68.500	44.333	7.7165**

** significant at 1% level of probability

From the results given in Table-28 it is clear that there was significant difference between the beneficiary and non-beneficiary farmers with respect to their level of awareness, attitude, knowledge and extent of adoption of recommended practices through the coconut development programmes.

Fig - 8 - MEAN SCORES OF BENEFICIARY & NON BENEFICIARY FARMERS(AREA EXPANSION SCHEME)



A comparison of mean scores of the beneficiary as well as non-beneficiary farmers with their level of awareness, attitude, knowledge and extent of adoption revealed that the highest difference was noticed in the case of extent of adoption (mean scores being 68.50 and 44.33 respectively). This was followed by level of knowledge about improved coconut farming practices (mean scores being 9.800 and 5.616 respectively). The order of difference between the beneficiary and non-beneficiary farmers with respect to their level of attitude towards selected coconut development programme and awareness about coconut development programmes was (35.50 and 25.16) and (28.575 and 22.96) respectively.

4.5.2 Irrigation programme

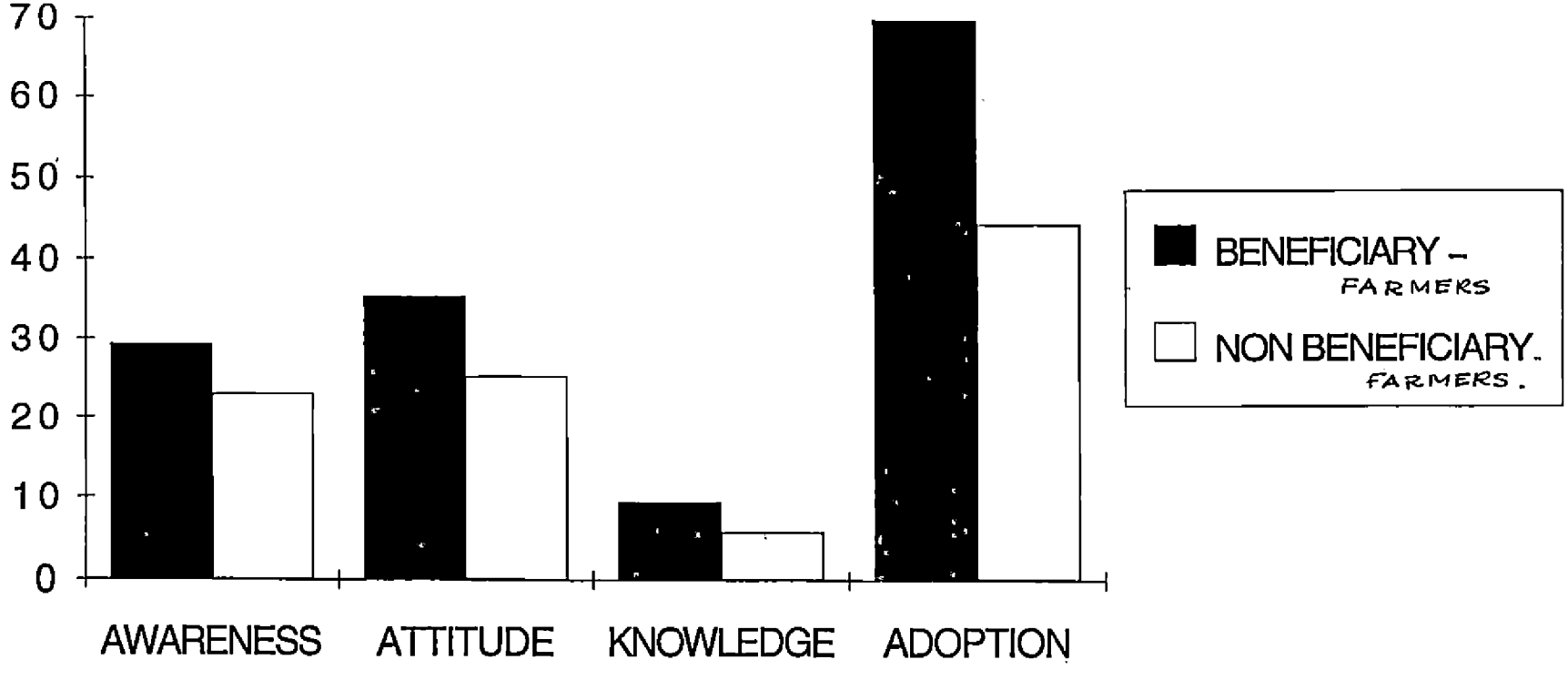
Table-29 Mean scores of beneficiary and non-beneficiary farmers on the level of awareness, attitude, knowledge and extent of adoption (Irrigation programme)

Sl.No.	Characteristics	Mean scores of Beneficiaries n = 40	Non-beneficiaries n = 60	Z-value
1	Awareness	29.325	22.966	2.4872*
2	Attitude	35.425	25.166	7.9612**
3	Knowledge	9.225	5.616	8.2074**
4	Adoption	69.800	44.333	7.5883**

* significant at 5% level of probability

** significant at 1% level of probability

Fig. 5. MEAN SCORES OF BENEFICIARY & NON-BENEFICIARY FARMERS (IRRIGATION PROGRAMME)



The results given in Table-29 revealed that there was significant difference between the beneficiary and non-beneficiary farmers with respect to their level of awareness, attitude, knowledge and extent of adoption.

The difference between the beneficiaries and non-beneficiaries of Irrigation programme was significant at 5 per cent level of probability, with respect to their level of awareness, while level of attitude, knowledge and extent of adoption, were significant at 1 per cent level of probability.

A comparison of the mean scores of the beneficiary as well as the non-beneficiary farmers along their level of awareness, attitude, knowledge and extent of adoption revealed that highest difference was noticed in the case of extent of adoption (mean scores being 69.800 and 44.333 respectively). This was followed by level of knowledge about improved coconut farming practices (mean score being 9.225 and 5.616 respectively). The order of difference between the beneficiary and non-beneficiary farmers with respect to the level of attitude and awareness was (35.425 and 25.166) and (29.325 and 22.966) respectively.

4.5.3 Integrated farming programme

Table-30 Mean scores of beneficiary and non-beneficiary farmers of Integrated farming programme on the level of awareness attitude, knowledge and extent of adoption

Sl.No.	Characteristics	Mean scores of Beneficiaries n=40	Non-beneficiaries n=60	Z-Value
1	Awareness	29.075	22.966	3.4828**
2	Attitude	33.975	25.166	7.8064**
3	Knowledge	8.825	5.616	7.5496**
4	Adoption	67.450	44.333	7.2576**

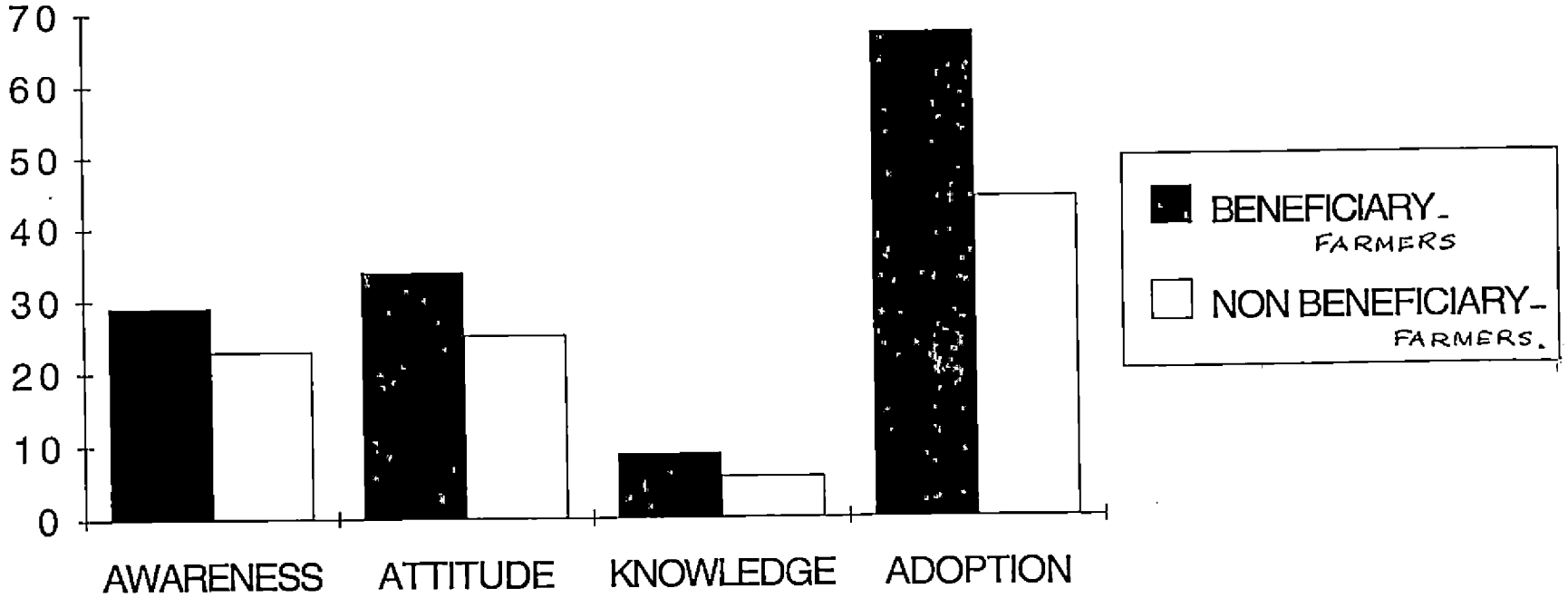
* significant at 5% level of probability

** significant at 1% level of probability

From `Z' values presented in the Table-30 it is clear that, there was significant difference between the beneficiary and non-beneficiary farmers of Integrated farming programme, with respect to their level of awareness, attitude, knowledge and extent of adoption of recommended practices.

A comparison of mean scores of the beneficiary as well as non-beneficiary farmers with their level of awareness,

Fig.1a. MEAN SCORES OF BENEFICIARY & NON-BENEFICIARY FARMERS
(INTEGRATED FARMING PROGRAMME)



attitude, knowledge and extent of adoption revealed that the highest difference was noticed in the case of extent of adoption (mean scores being 67.450 and 44.333) this was followed by level of knowledge (mean score being 8.825 and 5.616 respectively).

4.6. Constraints as perceived by farmers (beneficiaries and non-beneficiaries)

The constraints perceived by farmers about the coconut development programmes and in the adoption of recommended practices were listed and ranked. The results are presented in Table-31.

Table-31 Constraints as perceived by coconut growers about coconut development programmes and in the adoption of recommended practices.

Sl.No.	Constraint	Frequency	Rank
1	High labour cost	105	I
2	Non availability of labourers in time	99	II
3	Inadequate and untimely supply of coconut seedlings	75	III
4	Non availability of climbers for carrying out plant protection and harvesting	72	IV

5	Non availability of good quality seedlings during the planting season	78	V
6	Reluctance or negligence among the farmers in adopting improved scientific practices recommended through the development programmes	74	VI
7	Small sized holdings and poor economic status of coconut growers	71	VII
8	Incentives offered under the coconut development programmes are very meagre and not provided to the Krishi Bhavans in time	69	VIII
9	Delay in sanctioning the programme by the higher authorities	66	IX
10	Inadequacy in monitoring and evaluation	58	X

A perusal of Table-32 revealed that lack of proper linkage and co-ordination between various agencies involved in the implementation of coconut development programmes was the most important constraint perceived by Agricultural Officers in the effective implementation of coconut development programmes closely followed by procedural complexities in sanctioning the assistance under the programme, inadequacy of infrastructure placed at Krishi Bhavan level and lack of

4.7. Constraints as perceived by Agricultural Officers in the implementation of coconut development programmes.

An attempt was made in the present study to identify the constraints as perceived by Agricultural Officers in the implementation of coconut development programmes. The constraints were ranked on the basis cumulative index, in the order of importance and presented in the following table.

Table-32 Constraints as perceived by Agricultural Officers in the implementation of coconut development programmes.

Sl.No	Constraints	Cumulative index	Rank
1	Lack of proper linkage and co-ordination between various agencies involved in the implementation of coconut development programme	84	I
2	Procedural complexities in sanctioning the assistance under the programme	83	II
3	Inadequacy of infrastructure placed at Krishi Bhavan level	80	III
4	Lack of good rapport between the implementing and sanctioning agencies	79	IV

5	Lack of adequate financial assistance and subsides are not given in right time	60	V
6	Non availability of sufficient water for irrigation, during summer months	56	VI
7	high cost of inputs	48	VII
8	Lack of proper supervision and guidance from the officers concerned	45	VIII
9	Lack of conviction about th economic feasibility or recommended practices	44	IX
10	Non availability of Plant Protection equipments	40	X

From the Table-31 it was clear that high labour cost was the most important constraint perceived by both categories of farmers (beneficiaries and non – beneficiaries) closely followed by non-availability of labourers in time to carry out farm operations. Inadequate and untimely supply of coconut seedlings, non-availability of climbers to carry out harvesting and plant protection measures, lack of adequate financial assistance and subsidies are not given in right time were ranked 3 to 5 in the descending order by the coconut growers.

good rapport between the implementing and sanctioning agencies in that order. Non-availability of good quality coconut seedlings was the fifth important constraint. Delay in sanctioning the programme from the higher authorities, inadequacy in monitoring and evaluation were least important constraints as perceived by Agricultural officers.

DISCUSSION

5.DISCUSSION

The results obtained in the present study are discussed in the following main heads.

5.1. Level of awareness, attitude, knowledge and adoption of recommended practices by beneficiary and non-beneficiary farmers of the three selected coconut development programmes.

5.2. Relationship of level of awareness, attitude, knowledge and extent of adoption of beneficiary and non-beneficiary farmers with their selected characteristics.

5.3. Inter relationship of level of awareness, attitude, knowledge and extent of adoption of farmer respondents.

5.4. Comparison of the beneficiaries of the three programmes, according to their level of awareness, attitudes, knowledge and extent of adoption.

5.5. Comparison of beneficiaries and non-beneficiaries according to their level of awareness, attitude, knowledge and extent of adoption.

5.6. Constraints as perceived by farmers about development programmes and in the adoption of recommended practices.

5.7 Constraints experienced by Agricultural officers in the implementation of coconut development programmes.

5.1. Level of awareness, attitude, knowledge and extent of adoption of recommended practices by beneficiaries and non beneficiaries of the three selected coconut development programmes.

5.1.1. Beneficiaries of Area expansion programme

5.1.1.1. Level of awareness about coconut development programmes: Data in Table 2 indicated that more than half of the farmers (57.50 per cent) were having high level of awareness about coconut development programmes. The high scores obtained for these categories, indicated that the majority of beneficiary farmers of area expansion programme had fairly good awareness about coconut development programmes. This could be attributed to the prevalence of good information sources through mass media, contact with extension agencies and interpersonal communication among farmers in the area.

5.1.1.2. Attitude towards area expansion prgramme: A perusal of the Table 3 revealed that majority (60.00 per cent) of the beneficiaries were having favourable attitude towards the area expansion programme. Even though all the beneficiaries were aware about the programme, 40 per cent of beneficiaries are yet to develop an equal extent of favourable attitude towards the programme. This may be due to certain constraints being experienced like procedural complexities in the availing the assistance, delay in getting the assistance and inadequate subsidy provided under the programme. Avoiding the unnecessary procedural delay in sanctioning the assistance under the programme and increasing the amount of subsidy provided under the programme may help to develop a better attitude towards this programmes.

5.1.1.3 Level of knowledge about recommended practices: From the data presented in Table-4 it could be seen that, more than half of the beneficiaries (55.00 per cent) possessed high level of knowledge about recommended coconut farming practices. However, 45 per cent of the beneficiary farmers of Area Expansion Programme were yet to gain an equally better knowledge about the improved coconut farming practices. This could be attributed to certain constraints like lack of proper extension contact, lack of communication facilities etc. Strengthening the periodical field visit by

the extension workers, imparting knowledge through conducting coconut seminars, group meeting etc. may help to improve the level of knowledge of farmers about recommended practices.

5.1.1.4. Extent of adoption of recommended coconut farming practices: The results presented in Table-5 revealed that more than half of the beneficiaries of Area Expansion Programme (55.00 per cent) came under low level of adoption of recommended coconut farming practices. Only 45.00 per cent of beneficiaries showed high adoption rate of recommended practices. From the results it could be seen that, even though majority of the beneficiaries possessed high level of awareness and positive attitude towards the programme and high level of knowledge about recommended coconut farming practices, their preparedness to adopt the same in their field is not very encouraging. This may be due to certain constraints being experienced like nonavailability of labourers, high cost of labour, high cost of inputs, untimely supply of inputs etc. Strengthening the input supplies and plant protection services may help to increase the adoption of recommended practices.

5.1.2 Beneficiaries of Irrigation programme:

5.1.2.1 Level of awareness about coconut developmer programmes: The data presented in Table-6 indicate tha majority of the selected beneficiaries had a high level c awareness about coconut development programmes. The hig scores obtained to these categories, show the fairly goc level of awareness attained by the beneficiaries. As in th case of Area Expansion Programme, interpersonal and mass media information sources might have played their roles here also and hence the result.

5.1.2.2 Attitude towards irrigation programme: A perusal of the Table-7 reveals that majority (62.50 per cent) of the beneficiaries were having favourable attitude towards the irrigation programme. But 37.50 per cent of beneficiaries are yet to develop a favourable attitude towards the irrigation programme. This may be due to certain constraints like, inadequate subsidy provided under the programme and procedural delay in sanctioning the subsidy by the authorities etc. Increasing the subsidy amount provided under the programme and extending the same to the farmers in time may help to develop a better attitude towards this programme.

5.1.2.3 Level of knowledge about recommended coconut farming practices: Data in Table- 8 showed that as in the case of Area expansion programme more than half of the beneficiaries (52.50 per cent) were having high level of knowledge about recommended coconut farming practices. But the remaining 47.50 per cent of beneficiaries belonged to the low knowledge category. This necessitates the need for improving the knowledge level of farmers by imparting training on recommeded package of practices through seminars, group discussions, result demonstrations etc.

5.1.2.4 Extent of adoption of recommended coconut farming practices: A perusal of Table-9 indicated that, more than half (55.00 per cent) of beneficiaries belonged to low adoption category. Only 45 per cent of beneficiaries had high adoption of recommended practices. The data also indicated that high level of awareness about, attitude towards development programmes and high level of knowledge about improved coconut farming practices will not result in better adoption of recommended practices. High cost of input especially for fertilisers and labour may be limiting factors for the full adoption of recommended practices. Assuring a resonable floor price for the nuts may help to motivate farmers adopt the recommended package of practices.

5.1.3 Beneficiaries of Integrated farming programmes :

5.1.3.1 Level of awareness about coconut development programmes: The data presented in Table-10 indicate that majority of beneficiaries (57.50 per cent) had a high level of awareness about coconut development programmes. The high scores obtained to these categories show the fairly good awareness attained by beneficiaries. As in the case of the other two programmes, interpersonal and mass media information sources might have played their roles here also and hence the result.

5.1.3.2 Attitude towards Integrated farming programme: A perusal of Table- 11 reveals that more than half of the beneficiaries (52.50 per cent) were having favourable attitude towards the Integrated farming programme. The remaining 47.50per cent are yet to develop a favourable attitude towards this programme. As in the case of the other two programmes, this may be due to procedural complexities in availing the assistance, inadequate subsidy, untimely supply of inputs etc. Increasing the subsidy amount extended for cutting and removal of the root(wilt) affected palms, developing irrigation facilities etc. and timely supply of inputs may help to develop a better attitude towards this programme.

5.1.3.3. Level of knowledge about recommended Coconut farming practices : Data in Table-12 showed that majority of beneficiaries (52.50 per cent) of the Integrated farming programme for the development of coconut small holdings were having high level of knowledge about improved coconut farming practices. The high scores obtained by these categories indicate fairly satisfactory level of knowledge about recommended coconut farming practices among the beneficiaries. This may be due to well developed and organised extension work in these areas.

5.1.3.4 Extent of adoption of recommended coconut farming practices: A look at the Table - 13 will indicate that half of the beneficiaries of Integrated farming programme, come under high level of adoption. The remaining 50 per cent of the beneficiaries are under low level of adoption. It could be seen that inspite of the fact that beneficiaries have satisfactory level of knowledge about recommended coconut farming practices, extent of adoption under the programme was at low level. This may be due to high cost of inputs, non-availability of labourers, high labour charge etc. which will hold back the cultivators from full adoption of the recommended practices.

5.1.4 Non-Beneficiaries:

5.1.4.1 Level of awareness about coconut development programmes : The data presented in Table-14 indicated that majority (56.66 per cent) of the non-beneficiaries had high level of awareness about coconut development programmes. But the scores obtained by this category in comparison to that of beneficiaries were very low. This calls for a concentrated effort on the part of the extension workers to create awareness among the farmers about the various coconut development programmes.

5.1.4.2 Attitude towards coconut development programmes : An examination of Table-15 shows that, majority (56.66 per cent) of the non-beneficiaries had favourable attitude towards coconut development programmes. Since the level of awareness was very low, the scores obtained for the level of attitude were also very low. This may be due to the reluctance of cultivators to switch over to scientific method of coconut farming.

5.1.4.3 Level of knowledge about recommended coconut farming practices: A Perusal of Table-16 indicates that, majority of non-beneficiaries (53.33 per cent) were having low level of knowledge about recommended coconut farming practices and

46.67 per cent of non-beneficiaries come under high level of knowledge category. But comparing the scores obtained by the beneficiaries, the scores of non-beneficiaries were very low. This calls for an urgent need to expose all the coconut growers to sceitific methods of coconut growing.

5.1.4.4 Extent of adoption of recommended coconut farming practices: The data presented in Table-17 indicates that, majority of non-beneficiaries (56.67 per cent) belonged to the low level of adoption of improved coconut farming practices. The poor level of knowledge about improved coconut farming practices recommended led to poor adoption rate, which was indicated from the very low scores obtained in the case of non-beneficiaries compared to that of beneficiaries.

5.1.5 Practice wise adoption behaviour of the respondents

The results shown in Table-18 and Figure-2 indicate that mean adoption score of beneficiary farmers of the three selected development programmes, with respect to individual practices, were significantly higher than that of the non-beneficiary farmers. The practice-wise adoption behaviour of different category of respondents are discussed below:

5.1.5.1. Beneficiaries of area expansion programme

An examination of Table-18.1, revealed that adoption of the practice of, filling the pits with top soil at the time of planting and adopting the recommended spacing secured maximum adoption scores of 93 and 92 per cent respectively. This is because of the impact of the technical guidance imparted to the beneficiaries of the programme, by the field extension workers. It was also observed that use of hybrid varieties of coconut for replanting especially TxD variety is on decrease. This may be due to non-availability of hybrid varieties in sufficient quantity and also due to susceptability of the TxD variety to moisture stress and diseases.

5.1.5.2 Beneficiaries of Irrigation programme.

The data presented in Table 18.2 revealed that sizeable percentage of beneficiary farmers (52.50 per cent) secured adoption score between 91 to 100, with respect to the adoption of irrigation practice. This shows that majority of beneficiary farmers under irrigation programme, irrigated 90 to 100 per cent of the palms in their coconut gardens. This is because of the financial assistance available for improving the irrigation facilities. Use of hybrid verieties for new planting is the least adopted practice, in this case also. All other practice showed medium level of adoption.

5.1.5.3. Beneficiaries of Integrated farming programme

An examination of Table-18.3 revealed that under Integrated farming programme also high level of adoption was seen in the case of irrigation and inter/mixed cropping practice. This may also be due to the financial assistance and technical guidance extended to the beneficiary farmers to improve the irrigation facilities and for raising inter/mixed crops in their coconut garden, which are the components of the Integrated farming programme. All other practices showed medium level of adoption except for hybrid varieties, which is very low in this case also.

5.1.5.4. Non-beneficiaries

The data presented in Table-18.4 revealed that the extent of adoption of individual practices was low in the case of non-beneficiary farmers, compared to beneficiaries of the programmes. However inter/mixed cropping and manuring practice secured maximum adoption score and use of hybrid varieties for new planting was the least adopted practice.

It is quite natural that farmers who are not enjoying any benefit from the Coconut Development Board, adopt the recommended paractices, to a lesser extent when compared with the beneficiaries. This again stresses the need for extending the knowledge about recommended paractices to all catagories of farmers through seminars, training, group discussions etc.

5.2. Relationship of level of awareness, attitude, knowledge and extent of adoption of respondents with their selected characteristics.

5.2.1 Beneficiaries of Area Expansion Programme:

5.2.1.1 Level of awareness about coconut development programmes: From the result of correlation analysis presented in Table 19 and Figure-3 it could be seen that mass media exposure of beneficiary farmers was positively and significantly related to their awareness about coconut development programmes. The remaining variables viz. farm size, farming experience, education, social participation, economic motivation, extension contact and scientific orientation were found to have no significant relationship with awareness.

But in the case of non-beneficiaries, the data presented in Table-22, showed that except farm size, education and economic motivation, all other variables viz. farming experience, social participation, extension contact, mass media exposure and scientific orientation were positively and significantly correlated.

As the level of exposure of farmers to various mass media increases, awareness also should increase. This was true in the case of beneficiary and non-beneficiary farmers. This result is in conformity with findings of Sajeevchandran

(1989). In the case of non-beneficiaries, their rich experience in coconut farming is a vital asset, which contributes much to their awareness about coconut development programmes even though it is a time consuming process.

It was found that as the social participation increases, awareness of non-beneficiaries also increases, but not in the case of beneficiaries. This clearly shows the fact that participation of non-beneficiaries in social institutions, viz., co-operative societies, farmers clubs, Kerakarshaka samithies etc. play an important role in improving their awareness and level of understanding about coconut development programmes.

Exposure to mass media was found to be positively and significantly correlated in the case of both beneficiaries and non-beneficiaries. This clearly shows the fact that both beneficiaries and non-beneficiaries use various mass media such as radio, T.V, print information materials etc. effectively to increase their awareness. The findings of this study is in conformity with the results reported by Sajeevchandran (1989).

Extension contact and scientific orientation also had a positive and significant relationship, in the case of non-

beneficiaries. Contact of farmers with various extension agencies involved in implementing coconut development programme, increases their awareness also. Since the non-beneficiaries were exposed to different mass media, they were well aware of the scientific cultivation practices. This may be the reason for the positive and significant relationship of the awareness of non-beneficiaries and scientific orientation. The positive and significant relationship between awareness and scientific orientation has been reported in closely related studies by Aristotle (1981) and Sajeevchandran (1989).

In the light of the above findings, the hypothesis set for the study that there will be no significant relationship between the independent variables and awareness of beneficiaries was rejected in the case of mass media exposure but accepted in the case of farm size, education, farming experience economic motivation, extension contact, social participation and scientific orientation. The hypothesis that there would be no significant relationship between the selected characteristics of non-beneficiaries viz., farming experience, social participation mass media exposure, extension contact and scientific orientation and their awareness about coconut development programme was rejected and accepted in the case farm size, education and economic motivation.

5.2.1.2. Attitude towards Area Expnsion Programme: A glance of Table-19 and Figure-4 shows that, except economic motivation and scientific orientation, all other variables were not significantly related with level of attitude of beneficiaries of Area Expansion Programme. In the case of non-beneficiaries all the selected characteristic were not significantly related with their level of attitude.

Beneficiary farmers of the Area Expansion Programme were more conscious of the profit to be obtained from the new plantation. This may be the reason for positive and significant correlation of economic motivation with attitude. The higher educational background and frequent contact with mass media would have helped the beneficiaries to become aware of the scientific cultivation practices, and develop a better attitude towards the programme. This may be the reason for the positive and significant relationship of attitude of beneficiaries towards Area expansion programme and scientific orientation.

Hence the hypothesis, set for the study that there will be no significant relationship between selected characteristics of farmers and attitude towards Area Expansion Programmes was rejected in the case of economic motivation and scientific orientation and accepted in the case of farm size, farming experience, education, social participation,

mass media exposure and extension contact. Regarding the non-beneficiaries the hypothesis was accepted.

5.2.1.3 Level of knowledge about coconut farming practices : A perusal of Table-19 and Figure-5 showed that except extension contact all the other variables were not significantly related with level of knowledge of beneficiary farmers of Area expansion programme about recommended coconut cultivation practices. In the case of non-beneficiaries except social participation, extension contact and mass media exposure, all other variables were not significantly related with the level of knowledge. The results with regard to extension contact agree with the findings of Kaleel (1978), Kamarudeen (1981), Haraprasad (1982) and Syamala (1988). The results obtained in the case of non-beneficiaries are in conformity with the results reported by Kaleel (1978), Haraprasad (1982) and Syamala (1988).

Therefore the hypothesis set for this study that there will be no significant relationship between selected characteristics of beneficiaries and knowledge about recommended coconut farming practices is rejected in the case of extension contact only and for all other variables it is accepted. But non-beneficiaries are concerned the hypothesis is rejected in the case of social participation,

extension contact and mass media exposure and accepted for all other variables.

5.2.1.4 Extent of adoption of recommended coconut farming practices: A glance of Table-19 and Figure-5 showed that, except extension contact, mass media exposure and scientific orientation, all other variables were not significantly related with extent of adoption of recommended practices, in relation to beneficiaries of Area expansion programme. But in the case of non-beneficiaries social participation, extension contact and mass media exposure were found to have a positive and significant relationship with extent of adoption. All other variables were not significantly related.

It was found that contact with extension agencies, exposure to various mass media and scientific orientation prompt the beneficiary farmers of Area Expansion Programme, to the adoption of recommended practices. This result is in conformity with the results reported by Anithakumari (1989) Sajeevchandran (1989) and Ramachandran (1992).

In the case of non-beneficiary farmers education, social participation, extension contact and mass media exposure lead to adoption of recommended coconut farming practices. Positive and significant relationship between adoption and

education was reported by Vijayakumar (1983) Prasannan (1987) and Anithakumari (1989). Krishnamoorthy (1985) and Bavalatti and Sundaraswamy (1990) reported positive and significant relationship between adoption and social participation. The positive and significant relationship between contact with extension agency and adoption is in confirmity with the results of Anithavijayan (1988) and Syamala (1988). The significant relationship between mass media exposure and adoption of recommended practices is on par with the findings of Reddy (1989), Satheesh (1990) and Ramachandran (1992).

In view of the above discussions, the hypothesis set for this study that there will be no significant relationship between the selected characteristics of farmers and extent of adoption, was rejected in the case of extension contact and mass media exposure.

5.2.2 Beneficiaries of Irrigation programme

5.2.2.1 Level of awareness about coconut development programmes: The correlation analysis results presented in Table-20, Figure-3 have shown positive and significant relationship of social participation, extension contact, and scientific orientation with awaren s of beneficiary farmers about coconut development programmes. But in the case of non-beneficiaries except farm size, education and economic motivation all other variables viz. farming experience, social participation, extension contact mass media exposure and scientific orientation were positively and significantly related. The positive and significant relationship between social participation and awareness was reported by Nandakumar (1980) and Haraprasad (1981).Selvakumar (1988) and Kunchu (1990) reported positive and significant relationship between extension contact and awareness. The positive and significant relationship between scientific orientation and awareness supports the results of Aristotle (1981) and Sajeevchandran (1989). The obtained relationship between farm size and awareness is on par with the findings of Nandakumar (1980) and Vijaya (1982).

In the light of the above findings, the hypothesis set for the study that there will be no significant relationship between the eight independent variables and awareness of

beneficiaries was rejected, in the case of social participation, extension contact and scientific orientation and accepted in the case of farm size, education, farming experience, economic motivation, and mass media exposure.

5.2.2.2 Attitude towards Irrigation programme : Table-20 and Figure-4 indicate that except farming experience all other selected characteristics of beneficiary farmers of Irrigation programme had no significant relationship with their level of attitude towards the programme. This result is in conformity with the findings of Ravichandran (1980) Jayavelu (1980) and Sajeevchandran (1989) in respect of farming experience and level of attitude towards development programmes. But in the case of non-beneficiaries all the eight selected characteristics were found not-significantly related.

It could be observed from the table that the farming experience was one of the vital factors which contributed to the development of favourable attitude towards the programme and this in turn may be the reason for the positive and significant relationship between farming experience and level of attitude of the beneficiaries towards Irrigation programme.

On the basis of above explanation, the hypothesis set for the study, that there will be no significant relationship between the selected characteristics and level of attitude was rejected in the case of farming experience of beneficiary farmers of the programme and accepted in respect of all other characteristics, in the case of both beneficiaries and non-beneficiaries.

5.2.2.3 Level of knowledge about coconut farming practices: The results of correlation analysis presented in Table-20 and Figure-5 depicted positive and significant relationship of farming experience, social participation, extension contact, mass media exposure and scientific orientation with level of knowledge of beneficiaries of Irrigation Programme. But in the case of non-beneficiaries except social participation, extension contact and mass media exposure, all the other variables were having no significant relationship with the level of knowledge. The result with regard to social participation agrees with the findings of Kaleel (1978) and Kamarudeen (1981). Positive and significant association between extension contact and level of knowledge of farmers about recommended practices was reported by Selvakumar (1988) and Kunchu (1990). Theodore (1988) and Kunchu (1990) reported positive significant relationship between mass media exposure and level of knowledge about recommended agricultural practices. The

obtained relationship between scientific orientation and level of knowledge of beneficiaries of Irrigation programme is on par with the findings of Kamarudeen (1981) and Syamala (1988).

The above discussion led to the rejection of the hypothesis set for the study that there would be no significant relationship between the level of knowledge of farmers about the recommended coconut farming practices and their selected characteristics such as farming experience, social participation, contact with extension agency, mass media exposure and scientific orientation. The hypothesis was accepted for remaining characteristics viz. farm size, education and economic motivation in the case of beneficiaries of Irrigation programme. In the case of non-beneficiaries the hypothesis is rejected in respect of mass media exposure, extension contact and social participation and accepted for all the other selected characteristics.

5.2.2.4 Extent of adoption of recommended coconut farming practices: The data presented in the Table-20 and Figure-6 revealed that, except farm size education and economic motivation all the other variables were positively and significantly related to the extent of adoption in the case of beneficiaries. But in the case of non-beneficiaries social participation and mass media exposure had a positive

and significant relationship with extent of adoption. The remaining selected characteristics were found not significantly related to extent of adoption of recommended coconut farming practices.

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

Farming experience of beneficiary farmers was positively and significantly related to the adoption of recommended practices. The higher experience in farming enables the farmers to take more risks in adopting the innovations in coconut cultivation.

The above finding is in confirmity with that of Grewal and Sohal (1971) and Anbalagan (1976).

Social participation was found to have positive and significant relationship with the level of adoption among both the categories of farmers. With the increase in participation of farmers in various social organisations, the farmers get more exposed to innovations. The above result was also reported by Ramamoorthy (1973), Anbalagan (1974) Kaleel (1978), Ravichandran (1980), Krishnamoorthy (1985) and Bavalatti and Sundaraswamy (1990).

There was a positive and significant relationship between mass media exposure of the beneficiary and non-beneficiary farmers and their adoption of recommended practices. This indicate the credibility attached to the mass media by the respondents about the recommended practices of coconut. The result obtained is in line with that reported by Haraprasad (1982) Balasubramanian (1985) Sankaran (1987), Satheesh (1990) and Ramachandran (1992).

In the case of beneficiaries, scientific orientation of farmers was found to have positive and significant relationship with their adoption behaviour. The possession of a scientific outlook is the basic necessity for farmers in order to develop a favourable attitude towards innovative researches and this in turn may lead to the adoption of the same. This may be the reason for the above result. This result is in agreement with the findings reported by Aristotle (1981), Prasannan (1987) Anithakumari (1989) Sajeevchandran (1989) and Ramachandran (1992).

Extension contact was positively and significantly related with the beneficiary farmers' adoption behaviour. Extension contact is an important component in the agricultural production process. This provides functional and authentic information on agriculture to the farmers. Contact with extension persons would help to motivate the farmers leading

to final adoption of the improved practices. Similar findings were reported by Anithavijayan (1988), Krishnamoorthy (1988) Syamala (1988) and Ramachandran (1992).

Economic motivation showed negative and significant relationship with adoption of recommended practices by the beneficiary farmers. The results of Balu (1980) and Anithakumari (1989) were on par with the above finding.

Among the eight characteristics studied, social participation, extension contact and mass media exposure were found to have significant influence on the adoption behaviour of both the beneficiary and non-beneficiary farmers.

Based on the above discussion the hypothesis that there would be no significant relationship between the selected set of characteristics of farmers and the extent of adoption of recommended practices was rejected with respect to farming experience, social participation, mass media exposure, extension contact and scientific orientation in respect of beneficiaries of Irrigation programme. Regarding education, social participation and mass media exposure, the hypothesis was rejected in the case of non-beneficiaries.

5.2.3 Beneficiaries of Integrated farming programme :

5.2.3.1 Level of awareness about coconut development programmes: A cursory look at the d presented in Table-21 and Figure-3 revealed that except mass media exposure and scientific orientation all the other selected characteristics were found to be not significantly related with the level of awareness of beneficiary farmers about coconut development programmes. But in the case of non-beneficiaries except farm size, education and economic motivation all the other variables viz. farming experience, social participation, mass media exposure, extension contact and scientific orientation were positively and significantly correlated.

Mass media exposure plays a vital role in influencing the beneficiary farmers' awareness about various coconut development programmes. Radio, T.V., Newspaper, frequent contact with extension agents etc. are very helpful in creating awareness. This makes transfer of scientific information easy and farmers get educated about various improved practices. This may be the reason for the positive and significant relationship of mass media exposure and scientific orientation with the level of awareness in the case of beneficiaries and non-beneficiaries. This finding

is in conformity with the results reported by Nandakumar (1980) Aristotle (1981) and Sajeevchandran (1989).

In the light of the above findings the hypothesis set for the study that there will be no significant relationship between the eight selected characteristics of beneficiary farmers of Integrated farming programme and their awareness about coconut development programmes was rejected for mass media exposure and scientific orientation and accepted for the remaining six characteristics.

5.2.3.2 Attitude towards Integrated farming programme : Out of the eight factors considered, two, namely, farming experience and scientific orientation were found to have positive and significant relationship with the attitude and remaining factors namely farm size, education, social participation, mass media exposure, economic motivation and extension contact had no significant relationship with the attitude of beneficiary farmers towards Integrated farming programme (Table 21 and Figure-4). The result of Ravichandran (1980) supports the present finding of positive and significant relationship of farming experience and attitude. Subburaj (1980) and Kamarudeen (1981) support the present result of positive and significant relationship between scientific orientation and attitude.

Total experience of farmers in coconut cultivation, is one of the vital factors which contributed to the development of favourable attitude towards the programme and this in turn may be the reason for the positive and significant relationship between farming experience and attitude of beneficiary farmers towards the programme.

The beneficiary farmers of the Integrated farming programme are in frequent contact with extension agencies and various mass media, which may help them to be well aware of the scientific cultivation practices and to develop a better attitude towards the programme. This could be the reason for the positive and significant relationship of attitude of beneficiaries towards the programme and scientific orientation.

In view of the above discussion, the hypothesis set for the study that there will be no significant relationship between selected characteristics of farmers and attitude was rejected in the case of farming experience and scientific orientation and accepted in the case of the remaining six variables. Regarding non-beneficiaries the hypothesis was accepted.

5.2.3.3 Level of knowledge about recommended coconut farming practices: Out of the eight factors considered, three, namely, social participation, extension contact and mass media exposure were found to have positive and significant relationship with their level of knowledge of both the beneficiary and non-beneficiary farmers. Education was also found to be positively and significantly related in the case of beneficiaries. The remaining factors viz, farm size, farming experience, economic motivation and scientific orientation were not significantly related.

The positive and significant relationship of social participation of both beneficiary and non-beneficiary farmers and their level of knowledge about improved scientific practices was also reported by Kaleel (1978) and Kamarudeen (1981). With the increase in participation of farmers in various social organisations like Krishi Bhavan advisory committee, Kerasamrashana samithi etc. may help to improve their level of knowledge about improved coconut farming practices and this in turn may be the reason for the above result.

Mass media exposure of both the groups of farmers was found to have positive and significant relationship with their level of knowledge. This result is in agreement with the findings of Haraprasad (1982) and Syamala (1988).

Extension contact was positively and significantly related with level of knowledge of both beneficiary and non-beneficiary farmers about improved coconut farming practices. Extension contact is an important component in the agricultural production process. This provides functional and purposive information on agriculture to the clientele. This may help to improve their level of knowledge about improved scientific practices and hence the result. Similar findings were reported by Kaleel (1978) Kamarudeen (1981) Haraprasad (1982) and Syamala (1988).

Education was found positively and significantly related with the level of knowledge of beneficiary farmers. Kaleel (1978) also reported that there is positive and significant relationship between education and level of knowledge of farmers about improved agricultural practices.

Based on the above discussion, the hypothesis that there would be no significant relationship between the eight selected characteristics of the beneficiaries of Integrated farming programme and their level of knowledge about recommended coconut farming practices was rejected for education, social participation, extension contact and mass media exposure and accepted for the remaining characteristics viz. farm size, farming experience, economic motivation and scientific orientation.

5.2.3.4 Extent of adoption of recommended coconut farming practices: The data presented in Table-21 and Figure-6 revealed that, out of the eight characteristics studied, social participation, extension contact and mass media exposure were positively and significantly related, in the case of beneficiaries and non-beneficiary farmers of Integrated farming programme and the remaining five characteristics were not significantly related.

There was positive and significant relationship between social participation of both beneficiary and non-beneficiary farmers and their adoption of recommended practices. Participation of farmers in various social organisations, such as Krishi Bhavan advisory committee, Kerasamrashana samithies etc. may help them to be more exposed to the new practices, which may in turn help them for acceptance of the same in their field.

The result obtained is in line with that reported by Ramamoorthy (1973) Anbalagan (1974) Kaleel (1978) Ravichandran (1980), Krishnamoorthy (1985) and Bavalatti and Sundaraswamy (1990)

Extension contact was positively and significantly associated with the adoption behaviours of both beneficiary and non-beneficiary farmers. Extension contact is an

important component in the agricultural production process. This provides functional and purposive information on coconut cultivation to the farmers. Contact with extension personnel may help to motivate the farmers leading to the final adoption of the improved practices.

Similar findings were reported by Anithavijayan (1988), Krishnamoorthy (1988) and Syamala (1988).

There was positive and significant relationship between mass media exposure of both beneficiary and non-beneficiary farmers and their adoption of recommended practices. The messages they received through the mass media would have convinced the farmers about the advantages in the adoption of the improved coconut farming practices, which may be the reason behind this result.

The result is in agreement with those reported by Haraprasad (1984), Reddy (1989) Umale et al (1991) and Ramachandran (1992).

Based on the above discussion, the hypothesis that there would be no significant relationship between selected set of characteristics and adoption of recommended practices was rejected with respect to social participation, extension contact and mass media exposure, in the case of both

beneficiary and non-beneficiary farmers. The same hypothesis was accepted in the case of farm size, farming experience, education, economic motivation and scientific orientation.

5.3. Inter relationship of level of awareness, attitude, knowledge and extent of adoption of respondents

A perusal of the data presented in Table 23, 24, 25 and 26 revealed that, all the four dependent variables viz., awareness, attitude, knowledge and adoption were positively and significantly correlated with each other, for both beneficiaries and non-beneficiaries in respect of the three coconut development programmes.

Awareness is acquiring information about any programme or new practice. It is considered as a prerequisite for development of favourable attitude. It is created with the help of mass media, and extension contacts. So awareness about the programme helps to know its objectives, benefits, new practices to follow etc; which may in turn help to improve their level of knowledge about the same. By critically evaluating the programme based on the educational level and experience of the respondents, it could be seen that they develop a favourable attitude towards the programme. Frequent contact with the extension agencies, participation in Kerasamrashnana samithies, Kerakarshaka seminars, group discussions etc. may add to Improve their knowledge about recommended coconut farming practices. So if a sound awareness is created among farmers, their attitude and level of knowledge will also change. This was indicated

by the positive and significant correlation between awareness attitude and level of knowledge in all the three coconut development programmes.

Formation of favourable attitude and development of a sound knowledge about the innovations is a prerequisite for adoption of the same. Persuation by extension personnel must also be influencing attitude of the beneficiaries. Even with a favourable attitude and high level of knowledge, many constraints such as financial and infrastructural can come on the way of adoption. The data presented in Table 23, 24, 25 and 26 show that there was a positive and significant relationship between attitude, knowledge and adoption for both beneficiaries and non-beneficiaries in all the three coconut-development programmes.

It was also found that, awareness can lead to adoption. This can happen in the case of educated younger generation, who due to their personal enthusiasm take risk, and adopt the recommended practices This could be the reason for the positive and significant relationship of awareness with adoption for both beneficiaries and non-beneficiaries in all the three coconut development programmes.

5.4. Comparison of beneficiaries of the three coconut development programmes, according to their level of awareness attitude, knowledge and extent of adoption

The data presented in Table 27 show the comparison between the beneficiaries of the three coconut development programmes in respect to their awareness, attitude, knowledge and extent of adoption.

5.4.1 Level of awareness about coconut development programmes: The chi-square value (3.91) in Table-27 clearly shows that there was no significant difference between the beneficiaries of the three coconut development programmes with respect to their level of awareness.

This may be due to the tendency of people to avail whatever financial help available from development agencies, but they are not much bothered to become aware of the concept of that particular programme. The extension personnel also should take pain to convince the farmers about the crux of the program instead of simply achieving the physical target.

A critical observation also shows that, among the programmes, beneficiaries of irrigation programme had maximum awareness about coconut development programmes (Rank Value 70.00).

In light of the above discussion the hypothesis set for the study that there will be no significant difference between the beneficiaries of the three selected coconut development programmes was accepted with respect to their level of awareness.

5.4.2 Attitude towards the selected coconut development programme: The chi-square value (3.15) presented in Table-27, reveals that there was no significant difference between the beneficiaries of the three coconut development programmes with respect to their level of attitude.

A critical observation shows that beneficiary farmers had more favourable attitude towards Irrigation programme (Rank Value 65.00) and Area expansion programme (Rank Value 64) These two programmes have been implemented for the last 10 years. In the process of implementation of these programmes, extension personnel might have influenced the farmers for achieving the physical and financial targets which might have resulted in bringing about a favourable attitude towards the programme.

On the basis of above explanation, the hypothesis set for the study that there will be no significant difference between the beneficiaries of the three selected coconut

development programmes with respect to their level of attitude was accepted.

5.4.3 Knowledge about coconut farming practices: The chi-square value (5.89) presented in Table-27, shows that there was no significant difference between the beneficiaries of the three selected coconut development programmes with respect to their level of knowledge.

A critical observation shows that beneficiaries of Area expansion programme had high level of knowledge (Rank Value 70.00). The beneficiary farmers were getting assistance under the programme for three years for new planting and the subsequent maintenance of seedlings. Hence they were in frequent contact with the extension agencies which in turn helped to improve their level of knowledge about recommended coconut farming practices.

In the light of above observation the hypothesis set for the study that there will be no significant difference between the beneficiaries of three selected coconut development programmes, with respect to their level of knowledge, was accepted.

5.4.4 Extent of adoption of recommended practices : The chi-square value (10.87) presented in Table-27, clearly show-that there was significant difference between the beneficiaries of three selected coconut development programmes, with respect to their extent of adoption.

Observing the data critically, it could be noticed that highest adoption was in the case of beneficiaries of Area expansion programme in new planting area (Rank Value 75.00). There is not much difference between the rank values of beneficiaries of Irrigation and Integrated farming programme, with respect to their extent of adoption, viz, rank value 50.00 and 56.00 respectively.

The beneficiaries of Area expansion programme are given technical and financial assistance for a period of three years. The incentives under the programme are distributed to the farmers in three annual instalments. Hence farmers were in frequent contact with the extension agencies, which in turn helped to motivate the farmers in adopting the recommended practices.

In the light of the above discussion, the hypothesis set for the study that, there will be no significant difference between the beneficiaries of three selected coconut

development programmes, with respect to their extent of adoption was rejected.

5.5 Comparison of beneficiaries and non-beneficiaries, with respect to their level of awareness, attitude, knowledge and extent of adoption.

The results shown in Table-28, 29 and 30 indicate that the mean scores for awareness, attitude, knowledge and adoption of beneficiary farmers were significantly higher than that of non-beneficiary farmers. Sajeevchandran (1989) also reported that there was significant difference between the beneficiary and non - beneficiary farmers of pepper development programmes with respect to their level of awareness, attitude and adoption. The findings in relation to the extent of adoption are in line with that of Swaminathan (1986), Sankaran (1987) and Ramachandran (1992). This may be due to the higher social participation, scientific orientation, mass media exposure, more frequent extension contact of the beneficiary farmers, compared to non-beneficiaries, for availing the financial assistance.

Critical analysis of this result in Table-28,29 and 30 and figure-7 showed that the three selected coconut development programmes, viz. Area expansion programme, Irrigation programme and Integrated farming programme had significant

influence on the coconut growers, in improving their level of awareness, attitude towards the programme, level of knowledge and extent of adoption of recommended practices.

On the basis of the above explanation the hypothesis set for the study that there will be no significant difference between the beneficiaries and non beneficiaries, with respect to their level of awareness, attitude, knowledge and extent of adoption was rejected.

5.6. Constraints as perceived by farmers about coconut development programmes and the adoption of recommended practices :

A perusal of the constraints presented in Table-31 reveals that certain constraints were considered as major ones both by beneficiary and non-beneficiary farmers which stood in the way of adoption of improved coconut farming practices.

Both the categories of respondents were in full agreement that high labour cost and non-availability of labour in time, are the most important constraints, in the adoption of the recommended practices. Other serious constraints identified were inadequate and untimely supply of coconut seedlings, non-availability of climbers for carrying out plant protection operations and harvesting and inadequate

financial assistance and delay in timely disbursement of the same.

The constraint 'high labour cost' was previously reported by Prasannan (1987). Inadequate and untimely supply of seedlings was reported by Prakash (1989).

The absence of trained persons to carry out plant protection operations in coconut garden is one of the major constraints, experienced by the coconut farmers. The training programme of the Coconut Development Board, started recently to train unemployed youths in plant protection operations and palm climbing using newly developed climbing device, will help to solve this problem to some extent. But efforts need to be mobilised to popularise the device and ensure the availability of the same.

Poor quality of seedlings and untimely supply of seedlings was considered as another important constraint by both categories of respondents. Starting decentralized nurseries of coconut in farmer's field with the technical supervision of Agricultural Officers at Krishibhavans may help to solve this problem to a certain extent.

Lack of adequate financial assistance and delay in timely disbursement is yet another major constraint reported by

coconut growers. Increasing the subsidy component provided under different programmes and disbursing the same directly to the beneficiaries by arranging public functions, in collaboration with the implimenting agencies functioning at different levels may help to overcome the existing problem.

The other constraints identified in the order of importance are non-availability of sufficient water for irrigation during summer months, high cost of inputs, lack of proper supervision and guidance from the extension officers, lack of conviction about the economic feasibility of the practices and non availability of sufficient number of sprayers at Krishi Bhavans on hire etc. Efforts are needed on the part of the authorities to find a reasonable solution to these problems.

5.7 Constraints as experienced by Agricultural Officers in the implementation of coconut development programmes

In the implementation of coconut development programmes, the Agricultural Officers of the Panchayat level Krishi Bhavans face several constraints. Some of the important constraints as expressed by them are ranked and presented in Table-32.

Lack of proper linkage and co-ordination between various agencies, viz, Coconut Development Board, KERAFED,

Agricultural Department etc. involved in the implementation of coconut development programmes was ranked as the important constraint in the order of importance. Nominating officers/representatives of the Coconut Development Board as members of the Krishi Bhavan advisory committe, organising coconut seminar at Block and Panchayat levels with the active involvement of personnel of the Coconut Development Board and the Department of Agriculture would pave way for strengthening the linkage and co-ordination between them.

Another major constraint identified in the order of importance was procedural complexities in availing the assistance under the programme. Several Official formalities are to be observed to obtain assistance under the coconut development programmes. For example, the Area expansion programme of the Coconut Development Board is implemented through the Krishi Bhavans of the department of Agriculture, as Board is not having field level offices at present. Hence in order to avail assistance under the programme, the farmers have to submit the filled applications to the Krishi Bhavans, along with land ownership certificate obtained from the village officer. The Agricultural officer in charge of Krishi Bhavan forwards the application to the Coconut Development Board with recommendation for subsidy after field verification. The subsidy is sanctioned in the Board's office and

distributed through the Krishi Bhavans. Starting field level offices, in the model of the Rubber Board, and implementing the programmes directly by the Board may be considered for more effective implementation of the programmes of the Board.

Other constraints in the order of importance are inadequacy of infrastructure placed at Krishi Bhavans, lack of good rapport between implementing and sanctioning authorities, non availability of good quality seedlings during planting season, and reluctance or negligence on the part of the farmers in adopting improved scientific practices etc. By organising subsidy distribution functions with the participation of field functionaries of different departments concerned with coconut development, it is possible to establish good rapport between development personnels and farmers. Efforts are needed on the part of the authorities to find reasonable solutions to these constraints.

SUMMARY

6. SUMMARY

The main objective of coconut development programmes is to enhance the production and productivity of coconut by extending financial assistance, material inputs and providing technical guidance to the farming community. It is not evident whether the technical and financial assistance provided through the coconut development programmes are effective in bringing about the desired change in the outlook of the coconut growers and in achieving the set targets. Only limited studies were conducted in the past to assess the effectiveness of coconut development programmes in Kerala. The present study was taken up to analyze three selected coconut development programmes with the following specific objectives.

a. To study the awareness and attitude of coconut growers towards coconut development programmes.

b. To study the knowledge and extent of adoption of recommended coconut farming practices by beneficiaries and non-beneficiaries.

c. To identify constraints, if any, in the adoption of recommended technologies under the development programmes.

d. To identify constraints as perceived by Agricultural officers responsible for the implementation of coconut development programme.

The investigation was carried out in Alapuzha district, which was found to have maximum number of beneficiaries under the three selected programmes. Two subdivisions viz. Alappuzha and Mavelikara, where all the three selected development programmes are being implemented were selected for the study. From each sub-division, two Krishi Bhavans were selected. From each Krishi Bhavan 30 beneficiary and 10 non-beneficiary farmers were selected randomly. Fifty Agricultural officers from both the sub-divisions were also included for the study. Thus, the study had a total sample 230 respondents, consisting 120 beneficiary farmers, 60 non-beneficiary farmers and fifty Agricultural Officers. Farm size, education, farming experience, social participation economic motivation, extension contact, mass media exposure and scientific orientation were selected as independent variables based on review of literature.

Awareness about, and attitude towards coconut development programme, knowledge about recommended practices and adoption of the selected practices recommended formed the dependent variables. An attempt was also made to identify the constraints as perceived by coconut growers in the adoption of recommended practices, and as experienced by

Agricultural officers in the implementation of coconut development programmes.

Regarding the measurement of variables, education was measured using the scale developed by Trivedi (1963). Extension contact was measured by the method followed by Bhaskaran (1979) after making appropriate modifications. The method suggested by supe (1969) was used to measure scientific orientation. The extent of mass media exposure was quantified using the procedure used by Anantharaman (1977). The scale developed by Trivedi (1963) was used to measure social participation. Economic motivation was measured using the method developed by Supe (1969).

The procedure adopted by Naik (1981) with slight modification as used by Kunchu (1990) was followed to measure the awareness of respondents about coconut development programmes.

The attitude of respondents towards selected coconut development programmes was measured by the attitudes scale developed for the purpose. The level of knowledge of respondents about recommended practices was measured using teacher made knowledge test. The adoption behaviour of the beneficiary and non-beneficiary farmers was measured using the method developed by Jaiswal and Dave (1972).

An interview schedule was prepared, pretested and used for collecting data from the farmer respondents, while data from the Agricultural Officers were obtained through questionnaire. The data were subjected to simple correlation analysis, Mann-whitney's U test and Krusk ll Walli's test. Percentages were also used for making simple comparisons.

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

1. The study revealed that majority of beneficiary farmers of the three selected coconut development programmes belonged to high level category with respect to their level of awareness about coconut development programmes and knowledge about recommended coconut farming practices. Regarding the attitude of beneficiary farmers towards the selected coconut development programmes, majority of them had favourable attitude. There was significant difference between the beneficiaries and non-beneficiaries with respect to their level of awareness attitude and knowledge.

2. Regarding the adoption of recommended practices, majority of beneficiary farmers and non-beneficiary farmers belonged to low level of adoption category. The percentage of

farmers having high level of adoption was more in the catagory of beneficiary farmers.

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

4. Practice_wise adoption of recommended practices showed that adoption of high yielding hybrid varieties for new planting was the least adopted practice, while spacing, filling the pits with top soil at planting time have shown high level of adoption among the beneficiary farmers. None of the farmers adopted application of fertilizers according to the recommended dozes. Most of the beneficiary farmers adopted 50 to 60 per cent of the recommended doze of fertilizers.

5. Extent of adoption of recommended practices was higher in the case of beneficiaries of Area Expansion Programme when compared to other two programmes. There was significant difference between the beneficiaries of the three selected development programmes with respect to their extent of adoption.

6. The study revealed that there was positive and significant relationship between selected characteristics such as mass media exposure, social participation, extension contact, scientific orientation and level of awareness of beneficiary and non-beneficiary farmers about coconut development programmes. In the case non-beneficiaries, farming experience was also positively and significantly related with awareness.

7. The study indicated that there was positive and significant relationship between farming experience, scientific orientation and economic motivation with level of attitude of beneficiary farmers towards coconut development programmes.

8. The study revealed that there was positive and significant relationship between extension contact, farming experience social participation, mass media exposure and scientific orientation with level of knowledge of beneficiary and non beneficiary farmer about the recommended improved coconut farming practices.

9. It was also found that there was positive and significant relationship between extension contact, mass media exposure scientific orientation, farming experience and social participation and adoption of recommended practices by both

beneficiary as well as the non-beneficiary farmers. Economic motivation was found negatively and significantly related with extent of adoption in the case of beneficiaries of integrated farming programme.

10. Inter correlation studies revealed that, awareness, attitude knowledge and adoption, were posi vely and significantly correlated with each other.

11. Results of Mann Whiteny U-test showed that there was significant difference between the beneficiary and non-beneficiary farmers with respect to their level of awareness, attitude, knowledge and extent of adoption.

12. The major constraints as experienced by the beneficiary and non-beneficiary farmers in adopting the recommended practices, in the order of importance were as follows :

1. Higher labour charges
2. Non availability of labourers in time
3. Inadequate and untimely supply of coconut seedlings
4. Non availability of climbers for carrying out plant protection operations and harvesting and
5. Lack of adequate financial assistance and subsidies which are also not given in right time.

13. The major constraints felt by Agricultural officers in implementing the coconut development programmes were:

1. Lack of proper linkage and co-ordination between various agencies involved in the implementation of coconut development programmes.

2. Procedural complexities in sanctioning the assistance under the programme.

3. Inadequacy of infrastructure placed at Krishi Bhavan level

4. Lack of good rapport between the implementing and sanctioning agencies and

5. Non-availability of good quality seedlings during the planting season.

The following are some of the suggestions for improving the modus operandi of the programmes.

1. Timely supply of coconut seedlings should be ensured. Proper measures are to be taken to eradicate the bottlenecks rampant in this regard, by starting decentralised nurseries

in the farmers field, and opening sales outlets at areas of heavy demand.

2. The beneficiary farmers may be provided with essential inputs like fertilizer, pesticide etc. along with financial assistance.

3. Labour saving group management programme may be strengthened and adopted in all coconut growing areas. This will help to reduce the cost of cultivation.

4. Training programme of the coconut Development Board for unemployed youths in plant protection and palm climbing using the new climbing device may be strengthened and implemented in all districts of Kerala State on a priority basis.

5. In order to convince the farmers about the economic feasibility of the recommended practices result demonstrations may be organised on farmers fields.

6. More number of farmer's training programmes, seminars, discussions, meetings etc. may be arranged at the village levels.

7. Technical officers of various organisations implementing coconut development programme, may also be included as members of the advisory committees of departmental organisations such as Krishi Bhavans.

8. Procedure in availing the assistance under coconut development programmes shall be simplified and assistance disbursed to the farmers in time.

9. Field level offices may be started by the Coconut Development Board, in the model of Rubber Board to implement the programmes directly.

10. Periodical visit of extension workers to the farmers field will enthuse the farmers in the adoption.

11. For the timely communication of information to farmers extension personnel should utilize the various mass media such as Newspaper, Radio, T.V, Journals etc. properly.

To conclude the analysis the coconut development programmes had a major impact on the adoption behaviour of farmers. The financial incentives provided through the development programmes enthused the farmers in the early adoption of recommended farming practices. More sincere and diligent efforts from the officials concerned with the implementation

of the programme will render the realization of all the coveted objectives possible within the prescribed time frame. It is earnestly hoped that the results of the present investigation would be of value in having a clear understanding of the response pattern of farmers to the selected development programmes . Based on the information revealed by this investigation, it is possible to introduce appropriate changes in ongoing programmes inorder to make them more effective and purposeful.

Suggestions for future lines of work

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

1. Conduct longitudinal studies in other districts of the state.

2. Conduct similar studies with respect to other coconut development programmes.

3. Hybrid varieties-now switching over to W C T and other varieties; analyze the reasons.

4. Conduct comparative studies on similar development programmes implemented in other coconut growing states.

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APPENDICES

Appendix - 1

AN ANALYSIS OF SELECTED DEVELOPMENT PROGRAMMES FOR PROMOTING COCONUT PRODUCTION IN KERALA

INTERVIEW SCHEDULE (FOR FARMER-RESPONDENTS)

Date:

Serial No:

1. Name of the Respondent :
2. Address :
3. Ward :
4. Panchayat :
5. Block :
6. Farm Size

   Total area owned : acres
7. (a) Total area cultivated with coconut : acres

   (b) Total area cultivated with hybrid coconuts :
8. Education : Illiterate/can read only/can read and write/primary school level/middle school/high school

level/college and above

9. Farming experience : How long have you been cultivating coconuts?

10. Social participation :

Institution	Member	Office holder	Other position
Panchayat/Co-operative society.			
Young farmer's Association			
Farmers discussion groups			
(Kerasamrakshana Samithies			
Krishi Bhavan Advisory Committee			
(Specify, Others, if any)			

11. Economic motivation

Statement	SA	A	UD	DA	SD
1. A farmer should work towards larger yields and economic profits					

2. The most successful farmer is one makes the most profit

3. A farmer should try any new farming idea which may earn him more money

4. A farmer should grow cash crops to increase monetary profits in comparison to the cultivation of food crops for home consumption

5. It is difficult for the farmers' children to make good start unless he provides them with economic assistance

6. A farmer must earn his living but the most important thing in life cannot be defined in economic terms

12. Extension contact Frequency of meeting with extension personnel

Two or more times a week/once in a week/once to thrice a month/never

13. Mass media exposure

Medium	Frequency
Radio	Daily
	Two to six days a week
	Once a week
	Once a fortnight
	Rarely
	Never
News Paper	Daily
	Two to six days a week
	Once a week
	Once a fortnight
	Rarely
	Never
Magazines, leaflets and bulletins	Regularly
	Occasionally
	Never
Films (seen during last year)	More than six times
	Four to six times
	One to three times
	None

Field days/agricultural functions (attended during last year)	More than six Four to six One to three

14. Scientific orientation

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

15. AWARENESS ABOUT COCONUT DEVELOPMENT PROGRAMMES

Are you aware of the following Coconut Development Programmes?

Name of the programme	Aware	Unaware
1. Scheme for the Expansion of area under coconut.		
2. Scheme for providing assistance for irrigation facilities in coconut gardens.		
3. Integrated farming in coconut small holdings for productivity improvement.		
4. Scheme for the production and distribution of T x D seedlings.		
5. Scheme for the establishment of demonstration plots.		
6. Scheme for adopting group management in coconut garden.		
7. Comprehensive spraying programme for the control of major pests and		
8. Minikit programme for the distribution of quality coconut seedlings free of cost.		
9. Scheme for the distribution of coconut seedlings at 50% subsidy.		

10. Scheme for rejuvenation of root (wilt) affected coconut gardens.

11. Scheme for providing assistance for installing drip irrigation units in coconut gardens.

12. Scheme for coconut technology development, including post harvest processing & marketing.

13. Scheme for providing training to unemployed youths in conducting harvesting & plant protection operations in coconut.

14. Scheme for providing assistance to artisans for making handicrafts using coconut shell, wood, leaf etc.

15. Scheme for promoting fertilizer application in coconut gardens by providing subsidy.

16. Coconut package programme

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16. ATTITUDE TOWARDS SELECTED COCONUT DEVELOPMENT PROGRAMMES:-

Statement	SA	A	UD	DA	SD
1. Coconut Development programme is a blessing to coconut growers					

2. Incentives offered under coconut development programmes not reaching to intended farmers.

3. Coconut Development Programmes are based on location specific problems.

4. The coconut production can be increased only through the coconut development programmes.

5. The incentives offered through coconut development programmes making the farmers in debt.

6. The benefits under coconut development programme go only to large farmers.

7. There is nothing new to be offered by farmers in Coconut development programmes.

8. Coconut development programmes
play a very important role in
increasing coconut production
in Kerala.

17. KNOWLEDGE ABOUT IMPROVED COCONUT FARMING PRACTICES:-

1. Which is the best time to the collection of seed nuts?

2. Do you know the characters of a good coconut seedling?
Yes/No If yes, what are the characters

i)
ii)
iii)
iv)
v)

3. What is the spacing recommended by KAU in planting coconut under square system?

4. Whether the pits are filled with top soil while planting?
Yes/No. If yes, what should be the height below the ground level to be filled with top soil?

5. What should be the frequency of irrigation during summer months for young palms upto 2 years age in sandy soils ?

6. Do you know about the benefits of burial of husk in coconut gardens? Yes/No. If yes, how many years the effect of this will last in retaining moisture in coconut gardens ?

7. How many spilt doses of fertilizers are applied under rainfed conditions?

8. What is the approximate quantity of the following fertilizers required for a bearing palm under good management conditions?

Name of the fertilizer

Quantity(Kg)

i. Urea

ii. Massuriphos or
Superphosphates.

iii. Murate of potash

iv. Magnesium sulphate

v. 10:5:20: fertilizer mixture

9. What is the proportion of 5% BHC and sand used to control Rhinoceros beetle?

10. Which is the sprayer most suited for use, in spraying in bearing coconut garden?

11. Which is the chemical used to inject the trunk of coconut palm affected by Redpalm weevil?

12. Which is the chemical used for spraying against leaf root disease?

18. EXTENT OF ADOPTION OF IMPROVED COCONUT FARMING PRACTICES

I. Area under hybrid varieties

a) Total area under coconut cultivation?.....Acres

b) Name the hybrid varieties you have grown and its area?

Variety	Area (in acres)
(i)	
(ii)	

II. Filling the planting pits with topsoil

Do you fill the planting pits with top soil, while planting?

If yes, How much height from the ground level you have filled with top soil?

III. Spacing

What is the spacing you have adopted in new planting coconut, under different planting systems?

Planting system	Spacing adopted
(a) Triangular	
(b) Square	
(c) Single hedge	
(d) Double hedge	

IV. Irrigation

Have you irrigate your coconut palms during summer months?

If yes, how much area you have brought under irrigation?

V. Manuring

How much quantity of organic manure you have applied to a bearing palm in an year?

VI. Fertilizer application

Do you apply fertilizers in your coconut palms? If yes, how much quantities of fertilizers you have applied to a coconut palm per year?

(i) Under Rainfed conditions No. of split Qty (Kg)

N

P

K

(ii) Under irrigated conditions

N

P

K

VII. Plant protection

Do you apply any plant protection chemical to your coconut palm?

Yes/No

Name of the chemical	Dosage	Against What Pest/Disease
1.		
2.		
3.		
4.		

VIII. Area covered under inter/mixed cropping

a. Total area of coconut garden suitable for raising inter/mixed crops?

b. Area covered under inter/mixed crops?

20. What are the constraints you have experienced in the adoption of above practices?

1.

2.

3.

4.

Appendix-2

AN ANALYSIS OF SELECTED DEVELOPMENT PROGRAMMES FOR PROMOTING COCONUT PRODUCTION IN KERALA

QUESTIONNAIRE FOR AGRICULTURAL OFFICERS.

Identification of constraints in the implementation of Coconut Development Programmes as perceived by Agricultural Officers:

Following are the list of constraints in implementing Coconut Development programmes. Kindly go through these and made your responses by putting (tick) mark in the appropriate columns:

Sl.No.	Constraint	Most important	Important	Least important
1.	Inadequacy of infrastructure placed at Krishi Bhavan level			
2.	Frequent transfer of Agriultural Officers and Agricultural Assistants.			

3. Lack of provision for crop insurance in Coconut Development Programmes.

4. Unorganised adoption of management practices.

5. Lack of good rapport between implementing and sanctioning authorities.

6. Lack of facilities in conducting sufficient training camps and seminars at Krishi Bhavan level.

7. Reluctance or negligence on the part of the farmers in adopting improved Scientific practices.

8. Non availability of PP equipments.

9. Non availability of trained persons in carrying out PP operations.

10. Lack of credit arrangements and procedural complexities in getting loans.

11. Lack of publicity.

12. Inadequacy in monitoring and evaluation.

13. Lack of proper linkage and coordination between various agencies involved in the implementation of CD Programmes.

14. procedural complexities in sanctioning the assistance under the programmes.

15. Incentives offered under the Coconut Development Programmes are very meagre and not provided to the Krishi Bhavans in time.

16. Lack of sufficient staff in the Krishi Bhavans in implementing the programmes.

17. Delay in sanctioning the programmes from the higher authorities.

18. Political interference in selection of beneficiaries under each scheme.

19. Small sized holdings and poor economic status of majority of coconut growers.

20. Non availability of good quality seedlings during the planting season.

21. Kerala State land utilization Act preventing coconut growers from converting paddy field to coconut gardens.

Appendix-3

STATEMENTS FOR THE CONSTRUCTION OF ATTITUDE SCALE

Attitude of coconut growers towards Coconut Development Programmes.

Sl.No.	Statements	Scale Value
1.*	Coconut production can be increased only through coconut development programmes.	2.65
2.*	Coconut development programme is a blessing to coconut growers.	1.86
3.	The scheme for the expansion of area under coconut is beneficial for small and marginal farmers.	1.00
4.	Coconut development programme is of no use in helping farmers in increasing coconut production.	0.79
5. *	There is nothing new to be offered by farmers in coconut development programmes.	2.88
6.	Coconut development programmes adversely affect the cultivation of other crops in coconut garden	1.95

7.	The subsidy scheme for processing marketing is actually a constraint for better marketing.	0.83
8.	Incentives given under the different coconut development programme are very meagre.	0.50
9.*	Coconut development programme plays a very important role in increasing coconut production in Kerala.	2.65
10.	Group management programme will make a break-through in coconut production in Kerala,	0.26
11.	Since most of the past coconut development programmes failed to achieve their objectives, there is no meaning in formulating new schemes.	1.66
12.	Incentives/subsidies offered through various coconut development programme is a relief to coconut growers.	0.18
13.	Implementation of coconut development programme indirectly helped for corruption.	1.70
14.	Incentives offered through new planting and irrigation programme is just an eye wash.	1.71

15.* The incentives offered through coconut development programmes making the farmers in debt. 3.94

16. The beneficiaries covered under irrigation scheme are only rich farmers. 1.49

17.* The incentives offered under coconut development programmes not reaching to the intended farmers. 3.68

18. The procedural complexity deter the farmers from availing coconut development scheme facilities. 1.70

19. The productivity of the palms increased only due to the programme for promoting irrigation facilities in coconut garden. 0.36

20. There is wide scope for the scheme for giving assistance for installing drip irrigation in coconut gardens of Kerala. 0.50

21. Integrated farming programme actively increased the economic status of coconut growers. 1.52

22. Coconut development programme provide lot of employment opportunities to educated unemployed youths. 0.47

23. The training programme for unemployed youths in plant protection operation will help to solve the unemployment problem to a considerable extent. 0.43

24. Because of the scheme for production and distribution of quality coconut seedlings by different Government agencies there is no shortage for improved coconut seedlings 0.5

25. Implementation of various coconut development programmes helped to increase coconut production. 0.20

26. Group management programme will help in improving productivity of coconut gardens. 1.40

27. Coconut development programmes helped to influence farmers in adopting scientific management practices in coconut gardens. 0.33

28. Increase in coconut production occurred in the last decade is due to the impact of various coconut development programmes, 1.66

29. The cost of inputs is increasing due to the implementation of coconut development programmes. 1.70

30. Farmers participation is not ensured in implementing various coconut development programmes. 1.71

31.* The benefits under coconut development programme go only to large farmers. 4.35

32. Small and marginal farmers are not benefitted by drip irrigation programme. 1.07

33. Co-ordination and linkage of all developmental agencies is brought about due to the implementation of development programmes. 1.73

34. Scheme for rejuvenation of root (wilt) affected coconut gardens in Kerala should be continued for preventing the intensity of the disease. 1.73

35.* Coconut development programmes are not based on the location specific problems. 3.69

36. Coconut development programmes are meant for helping only small & marginal farmers. 1.30

37. Coconut development programmes must be implemented through out the country immediately. 0.53

38. Coconut development programme is a wasteful expenditure. 1.27

39. It is through coconut development programmes farmers became aware of innovations in coconut cultivation. 0.45

40. Scheme for rejuvenation of root (wilt) affected coconut gardens should immediately be stopped. 1.34

41. Coconut development programmes are based on location specific problems. 1.02

42. The incentives offered through coconut development programmes are reaching to the intended farmers only. 1.08

AN ANALYSIS OF SELECTED DEVELOPMENT PROGRAMMES FOR PROMOTING COCONUT PRODUCTION IN KERALA

BY

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ABSTRACT OF THE THESIS

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ABSTRACT

The present study under the title " An analysis of selected development programmes for promoting coconut production in Kerala" was undertaken to understand the level of awareness, attitude, knowledge and adoption behaviour of farmers in relation to selected coconut development programmes. The analysis covered the response pattern of both beneficiary and non- benificiary farmers to different variables. The constraints faced by both the group of farmers in the adoption of recommended practices and by the Agricultural officers in the implementation of the programmes were also analyzed.

The study was conducted in Alappuzha district and covered the following development programmes :

i) Scheme for expansion of area under coconut.

ii) Scheme for providing assistance for developing irrigation facilities.

iii) Integrated farming in coconut small holdings for productivity improvement.

The sample consisted of 120 randomly selected beneficiary farmers, 40 each under each programme and 60 non beneficiary farmers and 50 agricultural officers. Data were collected using interview schedule and questionnaire and suitable statistical techniques were employed in the analysis of data.

The study revealed that beneficiary farmers awareness, attitude, knowledge and adoption of the recommended practices, though partial in some aspects, was significantly influenced by the coconut development programmes.

Practice wise adoption by farmers revealed that use of hybrid varieties of seedlings for new planting was the least adopted practice. There was a tendency among the farmers to switch over to west cost tall and other varieties. Comparison of adoption behaviour of farmers under the three selected development programmes showed that the extent of adoption of recommended practices was higher in new planting area compared to other areas. It was also found that the level of awareness, attitude, knowledge and adoption was higher in the case of beneficiary farmers compared to non beneficiaries.

The results of the constraint analysis revealed the need for more attention to timely supply of coconut seedings, adoption of the labour saving group management practice and training programme of coconut development Board for the unemployed youths in plant protection and palm climbing. The results pointed out the need for proper co-ordination and linkage between various agencies involved in implementing coconut development programmes, simplifying the procedure in availing assistance under the programmes, starting field level offices, by Coconut Development Board in the model of Rubber Board and for proper planning and improvement in the pattern of implementation of coconut development programmes for accomplishing the cherished goals.