IMPACT OF
SPECIAL AGRICULTURAL DEVELOPMENT UNITS
ON THE AGRICULTURAL DEVELOPMENT OF
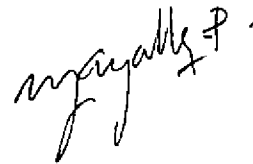# RURAL AREAS IN KERALA

BY

P. VIJAYA KUMAR

THESIS

SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENT FOR THE DEGREE
MASTER OF SCIENCE IN AGRICULTURE
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KERALA AGRICULTURAL UNIVERSITY

DEPARTMENT OF AGRICULTURAL EXTENSION
COLLEGE OF AGRICULTURE
VELLAYANI, TRIVANDRUM

1983

DECLARATION

I hereby declare that this thesis, entitled
"IMPACT OF SPECIAL AGRICULTURAL DEVELOPMENT UNITS
ON THE AGRICULTURAL DEVELOPMENT OF RURAL AREAS IN
KERALA", is a bonafide record of research work
done by me during the course of research and that
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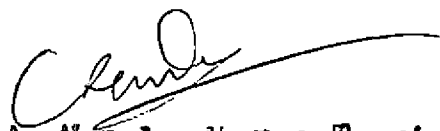fellowship or other similar title of any other
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P. VIJAYA KUMAR.

Vellayani,

26. 2. 1983.

iii

CERTIFICATE

Certified that this thesis entitled,
"IMPACT OF SPECIAL AGRICULTURAL DEVELOPMENT UNITS
ON THE AGRICULTURAL DEVELOPMENT OF RURAL AREAS IN
KERALA", is a record of research work done
independently by Shri. P. VIJAYA KUMAR under my
guidance and supervision and that it has not
previously formed the basis for the award of any
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Dr. A. Muraleedharan Tampi
Chairman,
Advisory Committee.
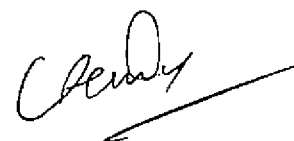Associate Professor of
Agricultural Extension.

Vellayani,
26 · 2 · 1983.

APPROVED BY:

CHAIRMAN:

        Dr. A. Muraleedharan Tampi
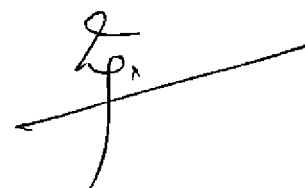
MEMBERS:

1. Dr. G. Thiagarajan Nair

2. Dr. V.K. Sasidhar

3. Shri. R. Balakrishnan Asan

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The gesture of affection and goodwill shown and the help rendered by my colleagues and friends are thankfully acknowledged.

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Vellayani,

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ABBREVIATIONS USED

KADP   —   Kerala Agricultural Development Project

SADU   —   Special Agricultural Development Unit

CNP   —   Coconut New Planting

CR   —   Coconut Rehabilitation

CHAPTER I

INTRODUCTION

India, calls for adopting more intensive systems of
agriculture, involving use of high yielding varieties, more
number of cropping cycles, high rate of fertilization coupled
with integrated farming systems by interlinking cropping,
forestry, plantations, pasture etc. to save on capital,
labour and energy inputs. This is, perhaps, feasible by
evolving and blending a set of appropriate agricultural tech-
nologies which not only ensure higher agricultural producti-
vity, but can also sustain agriculture by using renewable
organic sources, which are normally regarded as wastes. The
ever-rising pressure on land for habitation, agriculture and
industry, presents a problem which demands the utmost atten-
tion and application of the scientists in the field.

Efforts are going on to narrow the gap between lab and
land since the days of Community Development. Special
Agricultural Development Unit (SADU) coming under the perview
of Kerala Agricultural Development Project, is a programme
implemented in Kerala, with the aid of the World Bank.

The Government of Kerala sanctioned the formation of
SADU in December 1976. SADU is now operating in Kerala, in

the districts of Cannanore, Kozhikode, Malappuram, Idukky, Kottayam and Trivandrum. Coconut and pepper area development, intercropping, dairy development and seed gardens are the programmes implemented through SADU. Coconut New Planting programme is implemented in Cannanore and Malappuram districts, whereas, Coconut Rehabilitation programme is implemented in Cannanore, Kozhikode, Malappuram and Trivandrum districts.

Agriculture holds the key to the overall economic development of Kerala. Further, agriculture accounts for 58% of the states' income, and has several features which distinguish it from that in other parts of India. Low per-capita availability of land, high cropping intensity and predominance of perennial crops are some of the special characteristics. Because of the high density of population, the per-capita holding in Kerala are much smaller than in other states. Moreover, a wider variety of crops is grown in Kerala. Tree crops, mainly Coconut, Cashew, Rubber, and Pepper cover more than 70% of the area under cultivation in Kerala. SADU aims to improve the productivity of major foreign exchange earning crops like coconut and pepper, and thereby better the economic status of the farmers. To produce more, farmers must spend more on improved planting materials, fertilizers, pesticides, irrigation and such other areas. Taking this into account SADU is combining technical assistance with financial assistance, to achieve the goal.

Need for the study

It is not scientifically known whether the technical
and financial assistance provided by SADU is effective in
moulding the systems of farming of the farmers in a desi-
rable direction. Also, it is worthwhile to know how far
the farmers acquire knowledge on the improved techniques
of cultivation and how much they adopt these techniques in
their own fields to enhance production. Such objective
evaluation helps to locate the strong and weak points in the
programme formulation, which may be of immense help in the
future to chalk out other development programmes, as well as
to effect a better functioning of the present one.

Few comprehensive and direct studies were conducted in
the past to assess the effectiveness of Special Agricultural
Development Unit.

Objectives

1. To study and compare the level of knowledge of
   farmers in the project area and non-project area
   on improved agricultural technology on coconut
   development.

2. To study and compare the attitude of farmers of
   the project area and non-project area towards
   improved agricultural technology on coconut
   development.

3. To study and compare the extent of adoption of
   package of practices recommended by the scheme
   for the selected crop.

4. To study the relationship between adoption and
credit utilization behaviour of the beneficiaries
under SADU programme.

5. To study the relationship of personal and socio-
economic characteristics of the farmers in relat-
ion to their level of knowledge, attitude and
adoption of recommended practices.

6. To identify the constraints involved in the
implementation of the programme.

Limitations of the study

Only coconut development programmes implemented
through SADU were taken up for the present study. The study
had the limitation of time and other resources, as it was
undertaken as part of the requirement for M.Sc. (Ag.) pro-
gramme. The population of the study was restricted to
Malappuram and Trivandrum districts. Hence, the findings
may have some limitations in making a generalisation to
other areas and to other crops. In spite of these limitations,
it is expected that the findings would provide an insight
into the programme, which may be of help in the future for
better implementation of the programme.

THEORETICAL ORIENTATION

CHAPTER II

THEORETICAL ORIENTATION

The idea behind this chapter is to provide, in broad outline a discussion on the conceptual frame of reference used for this study. This helps to have a basis: for deciding the kind of variables to be included and the kind of data to be collected. Relevant literature reviewed on the problem under investigation have also been included.

Keeping in view the specific objectives of this chapter, the chapter has been dealt as follows:

   I.   Concepts of Development and Agricultural Development.

  II.   Role of Special Agricultural Development Unit (SADU) in agricultural development.

 III.   Effectiveness of SADU.

  IV.   Effectiveness of other credit giving institutions.

   V.   Dependent variables of the study.

  VI.   Relationship between knowledge, attitude and adoption and the independent variables.

 VII.   Credit utilization behaviour.

VIII.   Constraints involved in the implementation of the programme.

  IX.   Theoretical concepts and operational definitions.

I. Concepts of Development and Agricultural Development.

a. Development

Webster defined Development as the process or result of developing or advancing or state of being developed.

Rogers and Shoemaker (1971) defined Development as a type of social change in which new ideas are introduced into a social system in order to produce high per-capita income and high levels of living through more modern methods of production and improved social organisation.

Haque et al. (1977), described Development as a multi-variate quantitative and qualitative change, and may not be immediately measured cardinally.

Development is the process by which there are changes in the socio-economic and political system of the people, as a consequence of social change. Development, can thus be, agricultural or non-agricultural.

b. Agricultural Development

According to Alexander (1982) Agricultural Development would lead to

(1) Transformation of a subsistence agriculture to commercial agriculture.

(2) Increase in commercial activities.

(3) Increase in division of labour in agriculture.

(4) Transformation in occupational structure, and

(5) Modernization of beliefs and values.

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

In the context of SADU, Agricultural Development can
be defined as the improvement in productivity of foreign
exchange earning crops like coconut and pepper, and thereby
enhancing the economic status of farmers, especially small
holders.

II. Role of SADU on agricultural development.

According to the Kerala Agricultural Development
Project bench mark survey report published by the Project
Evaluation Unit, (State Planning Board,1979) 70% of the
area under cultivation in Kerala, is covered by tree crops,
mainly coconut, cashew, rubber and pepper. In fact, Kerala
is the largest produce of these crops in India. In 1975-'76
area under coconut accounted for 25% of the total cropped
area in the state,producing 90% of the country's milling
copra. Coir industry provides direct employment to more
than 6 lakhs people. Despite its key position in Kerala's
economy coconut yields per hectare are low and declining.
From properly cultivated trees, yield per hectare is

10,000 nuts,whereas, the average yield for the state was
6000 nuts/ha in 1969, and 4000 nuts in 1977. In the case
of pepper, though 95% of the country's production comes
from Kerala, its yields are low at 250 kg/ha compared to
1000 kg/ha, in some plantations in Indonesia.

In order to improve the productivity of these crops
and thus improve the economic condition of the farmers,
particularly the small holders, SADU was implemented.
SADU is giving technical and monitory assistance to the
farmers concerned.

In their report (All India Credit Review Committee,
1969) they stated that small and marginal farmers had not
benefited in proportion to their numbers and needs from
earlier programmes of rural development.

Dahya (1975) reported that small farmers' credit
requirements were greater, and he suggested a preferential
treatment to them.

Balakrishna et al. (1982) in their study found out
that agriculturists comprising owner cultivators and
tenants gave prime importance to infrastructure facilities
like banks; possibly due to awareness of direct and indirect
effect of infrastructure development on agriculture.

These studies point out the significance of credit
on agricultural development. The role played by SADU on

this angle, over and above the technical assistance provided
to the farmers, is quite notable.

III. Effectiveness of SADU.

Since the starting of the programme, it has been
evaluated by the Project Evaluation Unit of the Kerala State
Planning Board. The brief review presented here is mainly
based on the various evaluation reports prepared by the
Board.

According to the mid-term Appraisal Committee of the
Project Evaluation Unit (State Planning Board, 1980), achie-
vement in the case of Coconut Rehabilitation was 1850 ha
(11% of the target) and in the case of Coconut New Planting
it was 1029.7 ha (32% of the target) in terms of area
developed. The achievement in terms of loan sanctioned was
19.15% of the target fixed in the case of CR and 42.54% in
the case of CNP.

A later statistics presented in the progress report
of the Project Co-ordination Committee of the KADP,
(Project Co-ordination Committee, 1981) indicated that farm
development in terms of CNP was effected in an area of 2002 ha
and CR in 4518 ha, until then.

The achievements which fell below the target fixed
might have been due to inadequacy of extension at field
level, reluctance on the part of farmers to avail credit or

insufficient credit arrangement, as indicated in the
Evaluation Report of the Project Evaluation Unit.
(State Planning Board, 1979).

The report pointed out that the reluctance among the
farmers to avail long term credit might be due to reasons
like lack of clear perspective of the programme benefits,
high rates of interest, procedural problems &c.

The results of survey conducted (State Planning Board,
1980) showed that 75.6% of the farmers had good opinion of
the project benefit. 46.7% of the farmers were for simpli-
fication of the procedures for sanction of loan. 22.2% were
for higher scale of finance.

· The report of the State Planning Board (State Planning
Board, 1979) stated that intercropping/multiple cropping was
a universal practice in areas selected for Coconut
Rehabilitation.

In an evaluation report (State Planning Board, 1979)
it is recorded that in addition to the quantitative achieve-
ments the qualitative dimensions of the programme also
deserved special mention. It is indicated that ideas regard-
ing scientific management of tree crops and use of borrowed
capital for productive investment are gradually gaining
acceptance in the programme areas.

The evaluation report further stated that the area
that could be brought under irrigation come to nearly 21%
of the total area.

Report of the mid-term appraisal committee of the
Project Evaluation Unit,(State Planning Board, 1980) revealed
that both beneficiaries and non-beneficiaries are fully
convinced about the effectiveness of the programme. It
further stated that farmers who come under the perview of
SADU programme have realised the significance of fertilizer
application to coconut and are willing to apply fertilizers
according to the prescribed dose.

These studies indicate the achievements of the programme,
in a general perspective. But no comprehensive study could be
reviewed, which revealed the effect the programme has produced
on the knowledge, attitude and adoption of the farmers, as far
as the improved agricultural technology involved was concerned,
similar was the case with credit utilization also. It is
essential to measure the impact of any development programme
on these lines, since they form the fundamental links of
behaviour, and have profound influence on their standard of
living. This study was oriented to meet this requirement.

IV. Effectiveness of other credit giving institutions.

A brief review of some of the credit giving insti-
tutions, is presented below.

Agarwal (1971) reported that institutional credit formed about 62% of the total credit advanced and the rest from money lenders. Among the institutional sources commercial banks contributed about 47% while the agencies of taccavi, land development bank and co-operatives appear to have recorded lack lustre performance.

Athavale and Mishra (1971) in their study on land development banks on Bilaspur and Ratlam reported that the most important purpose of loan was improvement of land in Bilaspur which formed 53% of the total amount sanctioned and in Ratlam sinking of wells was the most important purpose and accounted for 62.62% of the total amount.

Singh (1971) found that in commercial banks the relative share of agricultural advance in total credit increased from 8.43% in 1969 to 11.85% in 1970, for State Bank of India Group and from 3.3 to 7.8 for the other nationalised banks.

Raju (1971) revealed that though the technology had influenced the farm returns, the bank borrowings also showed favourable effect on the total farm returns. It was also found that vast borrowings had highly significant positive interaction with (1) investment from other sources (2) land rent and (3) land area.

Sahu (1971) stated that the quantum of money advanced to agriculture largely for plantations recorded a very

significant rise within a few years, in the case of scheduled
commercial banks. He also reported that the big and medium
farmers are now inclined more towards durable capital invest-
ment projects with a view to adopting improved agricultural
technology, than towards merely raising the crop.

Saikia (1971) found that the average yearly operation
of Land Mortgage Banks was Rs.2.6 lakhs. In relation to the
need of the farmers it was found that the amount of loans
advanced was very inadequate.

Sisodla (1971) reported that in case of co-operatives
both short term and medium term loans advanced for agricu-
lture have gone up significantly within a short period. The
proportional allocation of short term loans advanced to the
cultivators showed that seasonal agricultural operations have
always received top priority.

Pawar and Sutar (1982) have revealed that giving
finance from nationalised banks at subsidised rates under
differential interest rates scheme of priority lending
approach for rural and agricultural development enabled the
beneficiaries to effect improvement in their productive
activities and also adopt new activities leading to additional
employment, production and income.

V. Dependent variables of the study.

A. Impact of knowledge on the adoption of improved practices.

Johnson and Haver (1953) reported that knowledge was
significantly related with the adoption of practices.

Williams (1958) reported that knowledge played an important role in adoption and decision making process.

Shankariah (1965) stated that knowledge and adoption are significantly related.

Roy et al. (1968) opined that a farmer before utilising a given item of modern technology needed to possess the knowledge about the introduced technology.

Nair (1969) stated that knowledge on improved practices influenced the adoption of farm innovations.

Singh and Singh (1970) found that knowledge on package of practices significantly contributed to adoption behaviour of farmers.

Prasad (1978), Kaleel (1978), Pillai (1978), Kamarudeen (1981) and Sivaramakrishnan (1981) have also reported a positive and significant relationship between knowledge and adoption of improved practices.

These studies indicate that there can be relationship between knowledge and adoption of practices recommended. So it was included as a variable in the study.

B. Impact of attitude of farmers on the adoption of improved practices.

Rai (1965) found a positive and significant relationship between attitude of farmers and adoption.

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

Majumdar and Majumdar (1967) found a positive and significant relationship between attitude and adoption.

Prasad (1978) reported a positive and significant relationship between attitude and adoption behaviour of farmers.

Kamarudeen (1981) and Haraprasad (1982) have also reported a significant relationship between the two variables.

These studies justify the inclusion of attitude as a dependent variable in the present study.

C. Impact of SADU on the adoption of recommended practices.

No direct review could be obtained on the impact of SADU on adoption. A brief review on this aspect, on some of the similar development programmes is presented below.

Singh and Singh (1974) reported that adoption scores of farmers of Demonstration villages were highly significant than control villages.

Supe and Salode (1975) reported that National Demonstrations were effective in helping scientifically oriented farmers in adoption.

Reddy and Reddy (1977) found that in the case of Drought Prone Area Programme, the participating farmers were adopting more of package of practices than non-participating farmers.

Kaleel (1978) reported that high adopters of improved agricultural practices were more in the IPD area than in non IPD area.

Samad (1979) reported that the adoption of improved agricultural practices was more in all the package areas than control area.

Rao and Reddy (1979) stated that there was substantial increase in adoption of practices as a result of Training and Visit system.

Sarkar and Reddy (1980) indicated a significant difference in terms of extent of adoption of package of practices by the farmers after the introduction of Training and Visit system, than before.

These studies indicate that there could be a difference in the extent of adoption between the beneficiaries and non-beneficiaries of SADU. This led to the selection of adoption as a variable to be included in the study. Moreover, it was found that knowledge and attitude were related with adoption, and hence there could be difference between the beneficiaries and non-beneficiaries, with respect to these variables also.

VI. <u>Relationship between knowledge, attitude, adoption and the independent variables.</u>

A. <u>KNOWLEDGE</u>

Table 1. <u>Review of studies showing the relationship between the selected independent variables and the level of knowledge of farmers on improved practices.</u>

Variable	Author(s)	Year	Relationship with the level of knowledge
1. Age	Bhaskaran and Mahajan	1968	negative
	Behara and Sahoo	1975	negative
	Rao and Reddy	1979	no relationship
	Sarkar and Reddy	1980	no relationship
	Ahamed	1981	no relationship
2. Education	Bhaskaran and Mahajan	1968	positive
	Supe and Salode	1975	positive
	Kaleel	1978	positive
	Rao and Reddy	1979	no relationship
	Ahamed	1981	positive
3. Farm size	Supe and Salode	1975	no relationship
	Rao and Reddy	1979	no relationship
	Sarkar and Reddy	1980	positive
	Haraprasad	1982	positive

Table 1 (contd...)

Variable	Author(s)	Year	Relationship with the level of knowledge
4. Income			
	Sushama	1979	no relationship
	Ahamed	1981	no relationship
5. Cosmopoliteness			
	Knight and Singh	1975	positive
	Kamarudeen	1981	no relationship

In the light of the above studies, which reiterate the influence of age, education, farm size, income and cosmopoliteness on the level of knowledge of farmers, these were selected as the independent variables of the study.

B. ATTITUDE

Table 2. Review of studies showing the relationship between the selected independent variables and the attitude of farmers towards improved practices.

Variable	Author(s)	Year	Relationship with attitude
1. Age			
	Bose	1961	negative
	Singh and Singh	1968	negative
	Das and Sarker	1970	no relationship
	Makkar and Sohal	1974	positive

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Table 2 (contd...)

Variable	Author(s)	Year	Relationship with attitude
2. Education			
	Singh and Singh	1968	positive
	Das and Sarkar	1970	positive
	Makkar and Sohal	1974	positive
3. Farm size			
	Das and Sarkar	1970	positive
	Makkar and Sohal	1974	positive
	Menon and Prema	1976	positive
	Rao and Reddy	1979	no relationship
	Sarkar and Reddy	1980	fairly related
4. Income			
	Das and Sarkar	1970	positive
	Sushama	1979	positive
5. Cosmopoli-teness			
	Kamarudeen	1981	positive

The review presented above reveals that age, education, farm size, income and cosmopoliteness could be important in deciding the attitude of farmers towards improved practices. Hence they were included as independent variables in the present study.

C. ADOPTION

Table 3. Review of studies showing the relationship between the selected independent variables and the extent of adoption of improved practices by farmers.

Variable	Author(s)	Year	Relationship with extent of adoption
1. Age			
	Wilkening	1952	negative
	Appa Rao	1971	no relationship
	Kemalsen	1971	positive
	Pillai	1978	negative
	Sarkar and Reddy	1980	no relationship
2. Education			
	Patel and Singh	1970	positive
	Grewal and Sohal	1971	positive
	Supe and Salode	1975	no relationship
	Sundaraswamy and Duraiswamy	1975	positive
	Rajendran	1978	positive
3. Farm size			
	Hussain	1971	positive
	Grewal and Sohal	1971	no relationship
	Subramanyam and Lekshmana	1975	positive
	Supe and Salode	1975	no relationship
	Kaleel	1978	no relationship
	Rajendran	1978	positive
	Reddy and Reddy	1977	positive

Table 3 (contd....)

Variable	Author(s)	Year	Relationship with extent of adoption
4. Income			
	Hussain	1971	positive
	Perumal and Duraiswamy	1972	positive
	Chandrakandan	1973	positive
	Kaleel	1978	positive
	Sushama	1979	positive
5. Cosmopoliteness			
	Fliegel	1960	no relationship
	Kittur	1976	positive
	Mahadevaswamy	1978	positive
	Kamarudeen	1981	positive

In the light of the above studies, it would be interesting to investigate into the possibility of these independent variables influencing the adoption of recommended practices by farmers.

VII. Credit utilization behaviour.

Agarwal (1971) reported that 87% of the institutional credit for agriculture disbursed, was utilized for productive purposes and 13% for unproductive purposes.

Athavale and Mishra (1971) reported that loans advanced by Land Development Banks was not fully utilized for productive purposes. He stated that the utilization was 59.18% of the total credit in Bilaspur district and 67.86% in Ratlam district.

Saikia (1971) reported that in the case of agricultural loans from Land Mortgage Bank, 41% of the borrowers had diverted 21% of the loans for other purposes.

Singh et al. (1971) opined that a considerable amount of total credit was diverted to meet the social ceremonies on the less progressive, small and medium farms. Due to their low financial position and surplus family labour small size farms of both categories, viz. progressive and less progressive, had begun to invest as non farm ventures such as purchase of raw materials and some other purposes with the help of credit.

Singh and Kahlon (1971) stated that as much as 65% of the total production credit was utilized for the purchase of chemical fertilizers and remaining amount for casual labour, high yielding variety seeds and insecticides.

Sisodia (1971) found out that, of the institutional credit for agriculture nearly 47% was utilised by the members for purpose for which it was actually obtained and the remaining 53% was utilised for other purposes, mostly unproductive.

Pawar and Suter (1982) reported that under the Differential Interest Scheme, the entire amount was utilised for the purposes for which it was borrowed.

These studies show that there is a possibility of diversion of loans for unproductive purposes. Credit utilization behaviour was indluded in this study to find out how far the beneficiaries of SADU were utilising the loans for the purposes for which borrowed.

VIII. Constraints involved in the implementation of the programme.

Rai (1965) reported that finance was the most important constraint for adoption.

Dhaliwal and Sohal (1965) stated that extension agency has concentrated its contacts with farmers having high educational and economic status.

Kaleel (1978) identified non-availability of inputs in time as the most important constraint in the case of IPD (Intensi> Develop units.

Rajendran (1978) found that high cost involved in the adoption was the most important problem. Untimely and inadequate supply and services was also found to be an important constraint.

The above studies indicate that the farmers would have to encounter with an array of problems while practicing

improved agriculture. Identifying the constraints
involved in the implementation of SADU programme, as felt
by the farmers, was therefore, included as an objective
in this study.

IX. Theoretical concepts and operational definitions.

Impact of SADU.

In this study, impact of SADU was measured in terms
of level of knowledge on the selected improved practices for
coconut, recommended by SADU, attitude towards these
practices and the extent of adoption of the improved
practices, by making a comparison of the beneficiaries and
non-beneficiaries with reference to the above mentioned
factors.

Beneficiaries.

Beneficiaries in this study are farmers who have availed
credit, either from Coconut New Planting (CNP) unit at
Chungathara in Malappuram district, or from Coconut
Rehabilitation (CR) unit at Balaramapuram in Trivandrum
district.

Non-beneficiaries.

Non-beneficiaries refer to those coconut growers
belonging to Mampad village in Malappuram district or to
Nemom village in Trivandrum district, both being areas not

covered by SADU programme, and being areas neighbouring
to Chungathara and Balaramapuram respectively.

Level of knowledge.

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

Operationally knowledge was defined as a body of
understood information possessed by a farmer with respect
to the improved practices of coconut cultivation.

Attitude.

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

In this study, attitude referred to the degree of
favourable or unfavourable disposition, as expressed by the
farmers towards the selected improved practices recommended
for coconut.

Extent of adoption.

For the purpose of this study, extent of adoption was
defined as, the degree of observable action, in the form of
use of the selected improved practices of coconut
cultivation, recommended by SADU.

Age

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

Education.

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

Farm size.

Farm size has been operationally defined as the number of acres of garden land, having coconut, owned and cultivated by a respondent.

Income.

Income was operationally defined as the total monthly income of the respondents.

Cosmopoliteness.

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

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

Credit utilization behaviour.

In this study credit utilization behaviour was defined as the degree to which the farmer utilised the credit availed through SADU, for the purpose for which it was borrowed.

It referred to the mode of utilization of credit namely proper utilization and improper utilization.

Constraints involved in the implementation of the programme.

This has been defined as the problems that a SADU farmer might encounter with, while practicing the improved practices of coconut cultivation.

METHODOLOGY

CHAPTER III

METHODOLOGY

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

1. Location of the study.

2. Respondents of the study.

3. Selection of practices recommended for coconut,
   to be included in the study.

4. Variables and their measurement procedure.

5. Procedure followed for data collection.

6. Statistical methods employed in the study.

1. Location of the study.

A. Selection of the districts.

The present investigation was taken up in Malappuram
and Trivandrum districts.

These two districts of North and South Kerala were
purposively selected for the study, in order to study both
Coconut New Planting (CNP) and Coconut Rehabilitation (CR)
programmes implemented through SADU. In addition to these
two programmes, SADU is responsible for Pepper Rehabilitation
programme also. This was not included in present study due
to want of time and resources.

The Chungathara Coconut New Planting unit and the
Coconut Rehabilitation unit at Balaramapuram, based on which

this study was conducted, are situated in Malappuram and Trivandrum districts respectively.

B. Selection of the units.

The target in terms of area, fixed for Coconut New Planting is 500 ha and that for Coconut Rehabilitation is 400 ha. It was decided to randomly select one CNP and one CR unit, which have crossed the target, as mentioned above, there are 15 CR units in Trivandrum district and CNP units in Malappuram district.

Thus CNP unit at Chungathara and CR unit at Balaramapuram were selected for the study. The figures on October 1981 indicate that the CR unit at Balaramapuram had covered 430.85 ha and CNP unit at Chungathara had covered 522.80 ha upto that date.

2. Respondents of the study.

A. Selection of beneficiaries.

The Special Agricultural Development Units are providing long term credit for Coconut New Planting or Coconut Rehabilitation, as the case may be. The beneficiaries were selected from the group of farmers who have availed credit for either of these purposes from the selected units at Chungathara in the case of CNP, or Balaramapuram in the case of CR. From the total list of farmers who have availed loan, a list of farmers, who had completed at least an instalment of the total loan, was prepared. From this the

FIG.1. MAP SHOWING THE LOCATION OF STUDY IN MALAPPURAM AND TRIVANDRUM DISTRICTS

CHUNGATHARA

MALAPPURAM

TRIVANDRUM
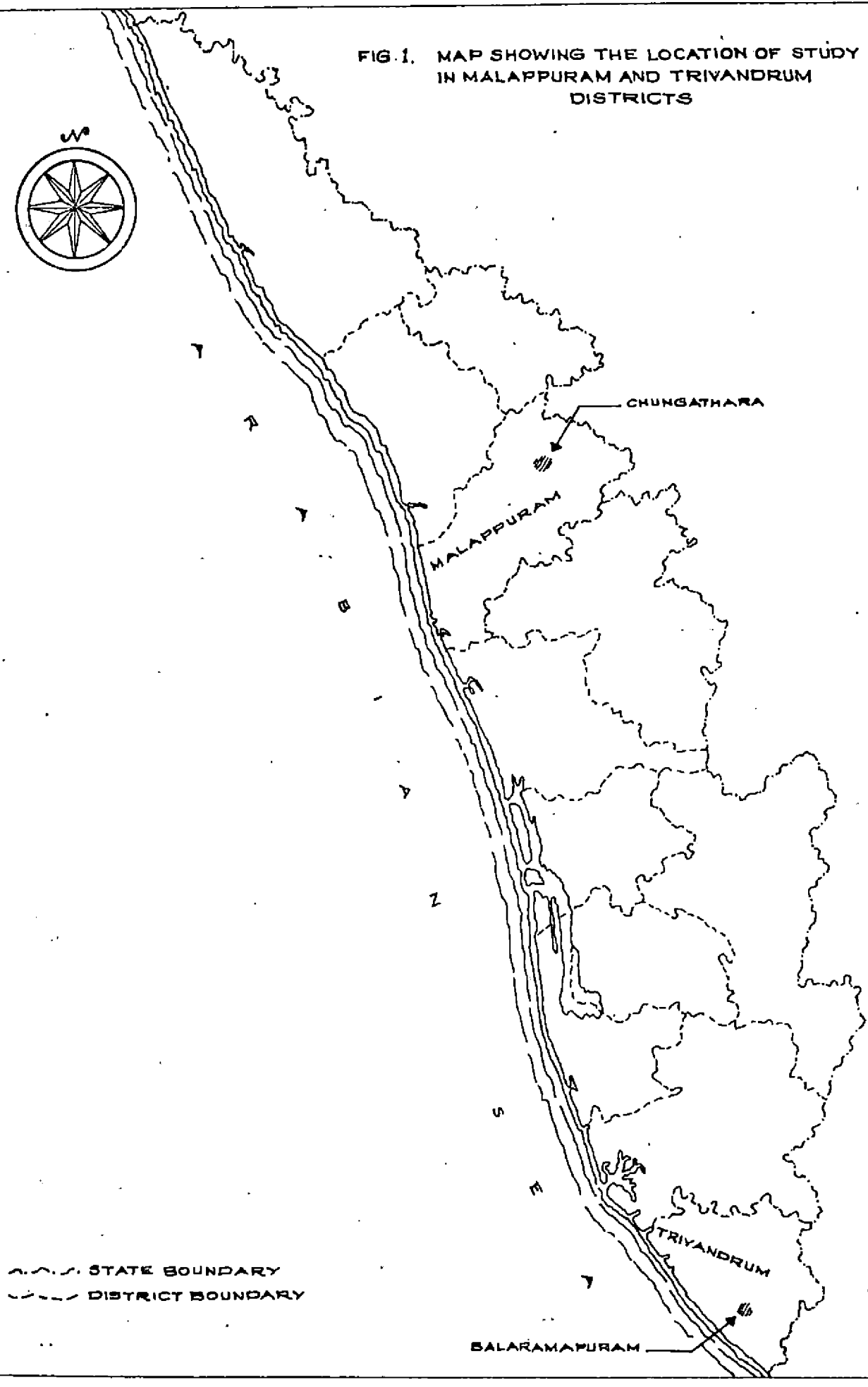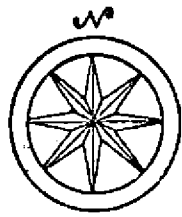
BALARAMAPURAM

STATE BOUNDARY
DISTRICT BOUNDARY

beneficiaries were selected by random sampling. An equal number of beneficiaries were selected from both the units. A total of 70 farmers formed the beneficiaries in the study.

B. Selection of non-beneficiaries.

An area neighbouring Chungathara unit, and another neighbouring Balaramapuram unit, were selected as control areas for the study. These areas were selected in such a way that they did not come under the area of operation of any of the Special Agricultural Development Units, operating in their respective districts. The areas selected were 'Mampad' village in Malappuram district, which is a neighbouring village of Chungathara unit and Nemom village which is a neighbouring area of Balaramapuram unit. An equal number was selected from each of these areas. A total of 70 coconut growers were selected by random procedure.

3. Selection of recommended practices for coconut cultivation, to be included in the study.

SADU, while disbursing loans for coconut development, takes into account the cost involved in practicing the various improved practices of coconut cultivation, like land development, purchase of seedlings, intercropping/ mixed cropping, fertilizers, application of plant protection chemicals and irrigation.

After consultation with the officials of SADU, the following practices were selected for the study.

1. Irrigation

2. Use of fertilizers

3. Use of plant protection chemicals

4. Intercropping, and

5. Seedling selection.

These practices were taken into account, on which the level of knowledge and extent of adoption of the respondents, were studied upon.

The practices considered while studying the attitude of the respondents, were

1. Coconut cultivation

2. Irrigation

3. Use of fertilizers

4. Use of plant protection chemicals, and

5. Intercropping.

Seedling selection was not included here, since there was no possibility of a variation amongst the different types of farmers in their attitude towards seedling selection, as was observed in the pilot study. All types of respondents would have a favourable disposition towards seedling selection, as far as their attitude towards seedling selection was concerned. Instead it was decided to include, in addition, a set of statements to study the attitude of the respondents towards coconut cultivation, on a general perspective.

4. Selection of variables and their measurement procedure.

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

a. Dependent variables.

    1. level of knowledge of farmers on improved practices in coconut cultivation.

    2. attitude of farmers towards improved practices in coconut cultivation.

    3. extent of adoption of improved practices in coconut cultivation, by farmers.

b. Independent variables.

    1. age

    2. education

    3. farm size

    4. income

    5. cosmopoliteness

c. Credit utilization behaviour.

d. Constraints involved in the implementation of the programme.

A. Measurement of Dependent variables.

1. Level of knowledge of farmers on improved practices of coconut cultivation.

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

Jaiswal and Dave (1972) calculated the Knowledge Scores as follows:

Knowledge Score $=$ Number of correct answers x 100
                    Total raw score

Singh and Singh (1974) developed a knowledge test based on the response of farmers to questions on various aspects of wheat cultivation. The total scores of each respondent was calculated by the formula $\frac{X1}{n}$ x 100 where,

X1 $=$ number of correct answers

n $=$ total number of questions

Nair (1969) measured knowledge level of farmers on recommended package of practices of rice using teacher made knowledge test with multiple choice questions. The same method was adopted for this study after a pre-test as described below:

a. Item collection

The content of knowledge test is composed of questions called items. A large number of items with respect to the selected improved practices of coconut cultivation were collected after consultation with officials of SADU, subject matter specialists and farmers. Altogether 41 items were collected. The items were converted into multiple choice questions.

b. Item analysis

This was done to yield the following information:

(1) index of item difficulty

(2) index of item discrimination

The collected 41 items were administered to 40 farmers. A score of '1' and a score of '0' was given for a correct and incorrect answer respectively. Then the total score for each respondent was calculated. Their responses were arranged in an ascending order of their scores ranging from lowest to highest. As suggested by Garret (1973) 27% of the lowest and 27% of the highest scores were taken for calculating item difficulty and item discrimination of the respondents.

27% with lowest scores and 27% with the highest scores were termed as low groups and high groups respectively.

(1) **Index of item difficulty**

The difficulty index of each item was calculated by arranging the percentages of correct answers of low groups and high groups respectively.

(2) **Index of item discrimination**

The discrimination index of each item, its capacity to discriminate the well informed from the poorly informed respondents, was calculated using the formula,

$$E = \frac{S_1 - S_2}{N/3}$$

where, E = discrimination index

S_1 and S_2 = frequencies of correct answer in high group and low group respectively.

N = total number of respondents in the item analysis sample.

Final selection of items

Those items which had difficulty index ranging from 25 - 75 and discrimination index above 0.20, were selected for knowledge test. With this presumption 23 items were selected for final inclusion in the test.

Method of scoring

Each respondent was given a score of 'one' for correct answer, and 'zero' for incorrect answer. The total knowledge score of each respondent was calculated by adding his score for each knowledge item. The maximum score attainable by a farmer in this test was 23 and the minimum was zero.

After computing the knowledge score of the respondents they were categorised into groups as follows:

Low	(Mean - 1 SD)	=	< 12
Medium	(Mean $\pm$ 1 SD)	=	12 - 20
High	(Mean + 1 SD)	=	> 20

2. Attitude of farmers towards improved practices of coconut cultivation.

Edwards (1957) has demonstrated the usefulness of attitude measurement scales for quick and reliable quantitative measure of attitude with large groups. Attitude scales afford to order the various stimuli on a psychological continuum with respect to the degree of the attitude each possesses. Such attitude scales provide us with means of

obtaining an assessment in quantitative terms the degree
of affect that an individual may associate with some
psychological object.

Attitude was measured in this study with the help of
arbitrary scale, developed for the purpose. Since five
practices were included in this study, five attitude scales
were prepared and they were combined to one attitude scale
for calculating the farmers' attitude towards the selected
improved practices of coconut cultivation.

Statements representing the universe of content of each
of the aspects selected for the study viz., (1) coconut
cultivation (2) irrigation (3) use of fertilizers (4) use of
plant protection chemicals and (5) intercropping were prepared,
after discussion with the officials of SADU. The collected
statements were then edited based on the criteria set by
Edwards (1957). Finally, six statements each were selected
for all the five different areas of investigation. Thus there
were a total of thirty statements.

The responses were collected on a five point continuum
viz., Strongly Agree, Agree, Undecided, Disagree and Strongly
Disagree. A score of 5 was given for Strongly Agree, 4 for
Agree, 3 for Undecided, 2 for Disagree and 1 for Strongly
Disagree. Thus, the maximum score that could be obtained for
a sub-scale was 30, and the minimum was 6.

The respondents were then categorised into groups as
follows, based on the total scores obtained by them.

Low   (Mean - 1 SD) = < 95

Medium   (Mean ± 1 SD) =   95 - 129

High   (Mean + 1 SD) = > 129

3. Extent of adoption of improved practices in coconut
    cultivation.

Different research workers have made use of different
methods to quantify adoption behaviour.

Wilkening (1952) took into account the potentiality of
adoption and made use of an index to measure the adoption of
improved farming practices. The index of adoption used was
the proportion of practices adopted to the total number of
practices applicable to that farmer. Considering the
differential nature of the practices, he suggested differential
weights in the adoption index.

Marsh and Coleman (1955) used 'Practice Adoption Scores'
for measuring adoption. It was computed as the percentage of
applicable practices adopted.

Fliegel (1956) constructed an 'Index of Adoption' of
farm practices making use of the correlation of several adoption
variables. Each of the 11 factors selected were factor
analysed. Adoption was given a score of 'one' and non-adoption
a score of 'zero'.

Beal and Rogers (1960) computed a single adoption scale
which credited a farmer with one point for adoption and 'zero'
for non-adoption.

To measure adoption of farm practices Chattopadhyay (1963) constructed an 'Adoption Quotient'. Different variables like potentiality, extent, weightages and time were taken into consideration.

Supe (1969) used an unweighted practice adoption score. He selected 10 practices for cotton, and for each practice, the total score for complete adoption was six. The practices divisible, were assigned partial scores for partial adoption.

Jaiswal and Dave (1972) used the 'Adoption Quotient' developed by Chattopadhyay with necessary modifications.

Singh and Singh (1974) also used an 'Adoption Quotient', which is a modification of that of Chattopadhyay (1963). According to this scale 'Adoption Quotient' of each respondent was calculated using the formula:

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

where,

$\sum$ = the summation

e = extent of adoption of each practice

p = potentiality of adoption of each practice

N = total number of practices selected

In this study, to measure the extent of adoption of selected practices, the method developed by Supe (1969) was followed with slight modifications. According to this method

a score of '3' was given for proper/complete adoption,
'2' for improper/incomplete adoption and '1' for non-adoption.

The total score obtained by each farmer was calculated
by summing up the score for each practice. The respondents
were then classified into 3 categories as follows.

Low   (Mean - 1 SD)   =   < 11
Medium   (Mean ± 1 SD)   =   11 - 14
High   (Mean + 1 SD)   =   > 14

B. Measurement of independent variables.

1. Age

Age was measured as the number of years the respondents
has completed at the time of interview, since his birth.

2. Education

The Education scale of Trivedi (1963) was used in this
study to measure education. The scoring was as follows:

illiterate   -   0

can read   -   1

can read and write -   2

primary school   -   3

middle school   -   4

high school   -   5

collegeate   -   6

3. Farm size

It was measured as the number of acres of garden land,
having coconut, owned and cultivated by a respondent.

4. Income

The total income was measured as the total monthly income of the respondents.

5. Cosmopoliteness

This was measured in terms of the farmers' extent of contact with outside village, such as, visiting the nearest town, the purpose of visit and the membership in organisation outside the village.

The scoring was as follows:

a. Frequency of visiting the town

two or more times a week	-	score 4
once in a week	-	score 3
once in a fortnight	-	score 2
once in a month	-	score 1
never	-	score 0

b. Purpose of visit

agricultural	-	score 3
personal or professional	-	score 2
other purposes	-	score 1
entertainment	-	score 0

c. Membership in organisation outside the village

member	-	score 1
no membership	-	score 0

C. Credit utilization behaviour

Bhaskaran (1978) assessed credit utilization by simple check method. The total amount spent by a farmer for the different cultivation practices of paddy was calculated. This was then compared with the total credit availed by the farmer. If the farmer utilised the whole amount or more than that of his credit availed for the season, his utilization was full and others considered as utilised partial.

In the present study, the farmers were in a similar fashion, categorised into two viz., those who have properly utilised the credit and those who have improperly utilised the credit availed by them.

The farmers who had utilised the credit properly, are those who had not been dehied a subsequent instalment due to the improper utilization of the previous instalment of credit.

Those who had improperly utilised the credit are, those who had been denied a subsequent instalment of credit due to the improper utilization of the previous instalment, or those who were defaulters in any other way.

Thus credit utilization was assessed as proper utilization or improper utilization.

D. Constraints involved in the implementation of the programme.

Based on discussion with officials of SADU and farmers, and also through a review of relevant literature,

problems faced by coconut growers, who were beneficiaries
of SADU, were collected. A list containing 17 such
constraints were included in the final interview schedule.

The response to each constraint was obtained on a
three point continuum viz., 'most important', 'important'
and 'least important'. In order to rank the constraints,
in their order of importance, a cumulative index was
calculated. For this, a weightage of '3' was given to the
response 'most important'; '2' to 'important' and '1' to
'least important'. The frequency of responses under each
category was multiplied with the corresponding weightage
and added upto get a cumulative index for the particular
constraint. Based on this cumulative index, the constraints
were ranked, the one with maximum value getting the first
rank.

5. Procedure followed for data collection.

The draft interview schedule constructed, was
pre-tested and in the light of the results, necessary
modifications were made. The final interview schedule was
then administered through personal interview of the
respondents. Prior to interviewing the farmers, the purpose
of the study was clearly explained to them. The data were
collected during the months of August - September 1982.
The questions were rendered in Malayalam while interviewing
the respondent farmers.

6. Statistical methods employed in the study.

(1) Simple correlation

Correlation coefficients were computed to find out the relationship between the dependent variables and each of the independent variables, and also to find out the relationship between dependent variables.

The formula used to compute the simple correlation was:

$$\gamma_{xy} = \frac{pxy}{\sigma x \sigma y}$$

where,

γ_{xy} = correlation between x and y

pxy = product moment of x and y

$\sigma x, \sigma y$ = standard deviation of the distribution of x and y

(2) Normal test of significance

The normal test of significance of difference between means was employed to compare the beneficiaries and the non-beneficiaries with respect to their level of knowledge, attitude and adoption of the selected improved practices of coconut cultivation. The formula used was:

$$Z = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\dfrac{s_1^2 + s_2^2}{n}}}$$

where,

Z = computed value for the normal deviate

$\overline{X_1}$ = mean of sample 1

$\overline{X_2}$ = mean of sample 2

s_1 = standard deviation of sample 1

s_2 = standard deviation of sample 2

n = sample size

(3) Kolmogorov - Smirnov two sample test.

Kolmogorov - Smirnov two sample test was applied to test the significance of difference between the groups of farmers within the beneficiaries. Practicewise comparisions were made with respect to the knowledge, attitude and extent of adoption of the farmers, belonging to the different groups. To apply this test, the cumulative step functions, of the two groups that are to be compared, namely, Sn_1 (x) and Sn_2 (x), are found out first.

Sn_1 (x) = k_1/n_1 k_1 being the number of respondents in the first group whose scores are less than or equal to x.

n_1 is the total number of respondents in this group.

Sn_2 (x) = k_2/n_2 k_2 being the number of respondents in the second group whose scores are less than or equal to x.

n_2 is the total number of respondents in this group.

The Kolmogorov - Smirnov two sample one tailed test focusses on:

$$D = \text{maximum } Sn_1(x) - Sn_2(x)$$

Then X^2 value is computed using the formula,

$$X^2 = 4D^2 \frac{n_1 \, n_2}{n_1 + n_2}$$

The significance of the resulting X^2 is determined by referring Table C of Siegel (1956). If the value is euqual to or larger than table value, it is considered as significant.

(4) Percentage analysis

Percentage analysis was applied to assess the relationship between credit utilization and the other selected variables of the study.

RESULTS

I. Comparison of the beneficiary farmers with
    non-beneficiaries, regarding their level of knowledge,
    attitude and extent of adoption of the improved practices
    in coconut cultivation.

1. KNOWLEDGE

Table 4. Comparison between beneficiaries and non-benefici-
          aries with regard to their cumulative score for
          knowledge on improved practices in coconut
          cultivation.

Categories	Mean scores	'Z' value
Beneficiaries	15.9143	
		4.0701**
Non-beneficiaries	12.90	

** Significant at 0.01 level

The result of the 'Z' test of significance revealed
that there was significant difference between the
beneficiaries and non-beneficiaries regarding their mean
knowledge scores. The test made it clear that the
beneficiaries possessed a significantly high knowledge on
the selected improved practices of coconut cultivation.

2. ATTITUDE

Table 5. Comparison between beneficiaries and non-beneficiaries
with regard to their cumulative score for attitude
towards improved practices in coconut cultivation.

Categories	Mean scores	'Z' value
Beneficiaries	111.8857	
		8.0256**
Non-beneficiaries	92.3571	

** Significant at 0.01 level

A glance at the table reveals that the beneficiaries
possessed a higher mean score than that of the control farmers.
This difference was found to be significant, and hence, it is
evident that the beneficiaries had more favourable attitude
towards improved practices of coconut cultivation, than the
non-beneficiaries.

3. EXTENT OF ADOPTION

Table 6. Comparison between beneficiaries and non-beneficiaries
with regard to their cumulative score for adoption of
improved practices in coconut cultivation.

Categories	Mean scores	'Z' value
Beneficiaries	12.3286	
		9.6949**
Non-beneficiaries	8.9286	

** Significant at 0.01 level

The data in table 6 established beyond doubt that the extent of adoption of improved practices in coconut cultivation by beneficiaries was significantly higher than that of non-beneficiaries.

B. Comparison of the scores obtained by the beneficiary and non-beneficiary farmers, for each of the selected improved practices.

a. KNOWLEDGE

1. Irrigation.

Table 7. Comparison between beneficiaries and non-beneficiaries with regard to their level of knowledge on irrigation.

Categories	Mean scores	'Z' value
Beneficiaries	2.30	
		4.8821**
Non-beneficiaries	1.6147	

** Significant at 0.01 level

The data in the table indicated that the farmers of SADU had significantly higher knowledge on irrigation than the non-beneficiaries.

2. Use of fertilizers.

Table 8. Comparison between beneficiaries and non-
beneficiaries with regard to their level of
knowledge on the use of fertilizers.

Categories	Mean scores	'Z' value
Beneficiaries	3.3571	
		4.5169**
Non-beneficiaries	2.4	

** Significant at 0.01 level

The result presented in table 8 made it clear that the
beneficiary farmers had better knowledge on the use of
fertilizers than control farmers.

3. Use of plant protection chemicals.

Table 9. Comparison between beneficiaries and non-
beneficiaries, with regard to their level of
knowledge on the use of plant protection
chemicals.

Categories	Mean scores	'Z' value
Beneficiaries	2.7286	
		3.4857**
Non-beneficiaries	2.0571	

** Significant at 0.01 level

The result of the normal test of significance revealed that there was significant difference between the two groups of farmers as far as their knowledge on the use of plant protection chemicals was concerned.

4. **Intercropping.**

Table 10. Comparison between beneficiaries and non-beneficiaries with regard to their level of knowledge on intercropping

Categories	Mean scores	'Z' value
Beneficiaries	3.9714	
		2.8055**
Non-beneficiaries	3.3	

** Significant at 0.01 level

The computed 'Z' value corroborated that there was significant difference between beneficiary farmers and non-beneficiary farmers with respect to their mean knowledge scores on intercropping.

5. **Seedling selection.**

The result of the normal test of significance on this aspect is presented in table 11.

Table 11. Comparison between beneficiaries and non-beneficiaries with regard to their level of knowledge on seedling selection

Categories	Mean scores	'Z' value
Beneficiaries	3.5714	
		2.3714*
Non-beneficiaries	3.0885	

* Significant at 0.05 level

A perusal of the data in table 11 revealed that the beneficiaries and non-beneficiary farmers differed significantly in their knowledge on seedling selection.

b. ATTITUDE.

1. Coconut cultivation

Table 12. Comparison between beneficiaries and non-beneficiaries, with regard to their attitude towards coconut cultivation.

Categories	Mean scores	'Z' value
Beneficiaries	24.5857	
		9.0471**
Non-beneficiaries	19.2714	

** Significant at 0.01 level

The computed 'Z' value, led to the conclusion that there was significant difference between beneficiaries and non-beneficiary farmers in their attitude towards coconut cultivation.

2. Irrigation

Table 13. Comparison between beneficiaries and non-beneficiaries with regard to their attitude towards irrigation

Categories	Mean scores	'Z' value
Beneficiaries	22.3143	
		6.6248**
Non-beneficiaries	18.4143	

** Significant at 0.01 level

The 'Z' value indicated a significant difference between the two groups of farmers. Beneficiary farmers possessed a higher mean score.

3. Use of fertilizers.

Table 14. Comparison between beneficiaries and non-beneficiaries with regard to their attitude towards the use of fertilizers.

Categories	Mean scores	'Z' value
Beneficiaries	21.7714	
		6.5240**
Non-beneficiaries	17.8857	

** Significant at 0.01 level

The data clearly showed that SADU farmers had a higher mean score. The 'Z' value computed, confirmed that there was significant difference between the attitude of farmers of SADU and the control farmers, in this case.

4. Use of plant protection chemicals.

Table 15. Comparison between beneficiaries and non-beneficiaries with regard to their attitude towards use of plant protection chemicals.

Categories	Mean scores	'Z' value
Beneficiaries	22.2714	
		7.2978**
Non-beneficiaries	18.3429	

** Significant at 0.01 level

The inference that could be drawn as a result of the normal test of significance was that there was significant difference between beneficiaries and non-beneficiaries in terms of their attitude towards the use of plant protection chemicals.

5. **Intercropping.**

Table 16. Comparison between beneficiaries and non-beneficiaries with regard to their attitude towards intercropping.

Categories	Mean scores	'Z' value
Beneficiaries	22.6429	6.8543**
Non-beneficiaries	18.6714	

** Significant at 0.01 level.

It was evident from the result presented in table 16, that the mean attitude scores of beneficiaries and non-beneficiaries for attitude towards intercropping, differed significantly. This indicated that SADU farmers had highly favourable attitude towards intercropping when compared to the non-beneficiaries.

C. **ADOPTION.**

1. **Irrigation.**

Table 17. Comparison between beneficiaries and non-beneficiaries with regard to their extent of adoption of irrigation.

Categories	Mean scores	'Z' value
Beneficiaries	1.8714	4.8239**
Non-beneficiaries	1.2143	

** Significant at 0.01 level.

The mean score for adoption of irrigation was considerably high in the case of beneficiary farmers than that of non-beneficiaries, and the 'Z' value showed that the difference was significant.

2. **Use of fertilizers.**

Table 18. Comparison between beneficiaries and non-beneficiaries with regard to their extent of adoption of fertilizers.

Categories	Mean scores	'Z' value
Beneficiaries	2.6571	
		9.7142**
Non-beneficiaries	1.5857	

** Significant at 0.01 level

The data indicated a higher mean score for adoption, for the use of fertilizers, in the case of beneficiaries. This difference was found to be significant.

3. **Use of plant protection chemicals.**

Table 19. Comparison between beneficiaries and non-beneficiaries with regard to their extent of adoption of plant protection chemicals.

Categories	Mean scores	'Z' value
Beneficiaries	2.60	
		10.7143**
Non-beneficiaries	1.4857	

** Significant at 0.01 level

The computed 'Z' value proved beyond doubt, that the beneficiaries were superior, in their adoption of plant protection chemicals, to the farmers of control area.

4. Intercropping.

Table 20. Comparison between beneficiaries and non-beneficiaries with regard to their extent of adoption of intercropping.

Categories	Mean scores	'Z' value
Beneficiaries	2.60	
		3.4917**
Non-beneficiaries	2.20	

** Significant at 0.01 level

It was encouraging to note that, the beneficiaries under SADU, were superior in their adoption of intercropping, when compared to the farmers of control area.

5. Seedling selection

Table 21. Comparison between beneficiaries and non-beneficiaries, with regard to their extent of adoption of seedling selection.

Categories	Mean scores	'Z' value
Beneficiaries	2.5714	
		1.6873 N.S
Non-beneficiaries	2.40	

N.S Not Significant

It was interesting to note that the means for adoption of the criteria for seedling selection did not differ significantly between the two groups viz., beneficiaries and non-beneficiaries.

II. Comparison between the groups among the beneficinary
farmers viz. (i) farmers possessing unirrigated land
and farmers possessing irrigated land and (ii) farmers
of Coconut Rehabilitation area (CR area) and the
farmers of Coconut New Planting area (CNP area), with
regard to their level of knowledge, attitude and extent
of adoption of improved practices in coconut cultivation.

A. KNOWLEDGE.

Comparison between (i) farmers possessing unirrigated land
and irrigated land, and (ii) farmers of CR area and CNP area,
with regard to their level of knowledge, on each of the improved
practices in coconut cultivation.

1. Irrigation.

Table 22. Comparison between farmers possessing unirrigated
land and irrigated land, with regard to their level
of knowledge on irrigation.

Score	Cumulative step function	
	Unirrigated $Sn_1 (x)$	Irrigated $Sn_2 (x)$
0	0/39	0/31
1	10/39	2/31
2	27/39	10/31
3	39/39	31/31

Maximum $Sn_1 (x) - Sn_2 (x) = 0.3697$

x^2 $= 9.4425**$

** Significant at 0.01 level

Table 23. Comparison between farmers of CR area and CNP area, with regard to their level of knowledge on irrigation.

Score	Cumulative step function	
	CR area $Sn_1 (x)$	CNP area $Sn_2 (x)$
0	0/35	0/35
1	6/35	6/35
2	21/35	16/35
3	35/35	35/35

Maximum $Sn_1 (x) - Sn_2 (x)$ = 0.1429

X^2 = 1.4294 N.S

N.S Not Significant

A perusal of the data presented in table 22 reveals that the farmers possessing unirrigated land and those possessing irrigated land differed significantly in their knowledge on irrigation. The X^2 value computed was 9.4425 which was significant at 0.01 level of probability.

A comparison was made on this line, between the farmers of CR area and CNP area, the results of which are presented in table 23. The computed value for maximum $Sn_1 (x) - Sn_2 (x)$ was 0.1429. The X^2 value calculated based on this was 1.4294 which indicated that these two groups of farmers had no significant difference between them, as far as their knowledge

on irrigation, was concerned.

2. Use of fertilizers.

Table 24. Comparison between farmers possessing unirrigated
land and irrigated land, with regard to their
level of knowledge on the use of fertilizers.

Score	Cumulative step function	
	Unirrigated $Sn_1(x)$	Irrigated $Sn_2(x)$
0	0/39	0/31
1	4/39	1/31
2	16/39	5/31
3	25/39	9/31
4	35/39	19/31
5	39/39	31/31

Maximum $Sn_1(x) - Sn_2(x) = 0.3763$

$x^2 = 9.7826**$

** Significant at 0.01 level

Table 25. Comparison between the farmers of CR area and CNP area, with regard to their level of knowledge on the use of fertilizers.

| Score | Cumulative step function | |
	CR area Sn_1 (x)	CNP area Sn_2 (x)
0	0/35	0/35
1	5/35	0/35
2	11/35	10/35
3	16/35	19/35
4	23/35	31/35
5	35/35	35/35

Maximum Sn_1 (x) - Sn_2 (x) = 0.2286

x^2 = 3.6677 N.S

N.S   Not Significant

The results presented in table 24 reveals that the farmers possessing irrigated land possessed significantly high knowledge on the use of fertilizers, when compared to the group of farmers with unirrigated land.

However, the x^2 value computed for comparing the farmers of CR area and the farmers of CNP area was only 3.6677 as indicated in table 25, which was not significant. Hence, it was concluded that the farmers of CR area and the farmers of CNP area did not

differ in their knowledge on the use of fertilizers,
significantly.

3. Use of plant protection chemicals.

Table 26. Comparison between farmers possessing unirrigated
land and irrigated land, with regard to their level
of knowledge on the use of plant protection chemicals.

Score	Cumulative step function	
	Unirrigated $Sn_1 (x)$	Irrigated $Sn_2 (x)$
0	1/39	0/31
1	10/39	1/31
2	28/39	8/31
3	30/39	15/31
4	39/39	31/31

Maximum $Sn_1 (x) - Sn_2 (x) = 0.3830$

x^2 $= 10.1341**$

** Significant at 0.01 level

Table 27. Comparison between farmers of CR area and CNP area,
with regard to their level of knowledge on the use
of plant chemicals.

Score	Cumulative step function	
	CR area $Sn_1 (x)$	CNP area $Sn_2 (x)$
0	1/35	0/35
1	9/35	1/35
2	20/35	13/35
3	24/35	21/35
4	35/35	35/35

Maximum $Sn_1 (x) - Sn_2 (x) = 0.2286$

$x^2 = 3.6677$ N.S

N.S Not Significant

A critical examination of the data presented in table 26,
led to the conclusion that there was significant difference
between the farmers with irrigated and unirrigated coconut
gardens, regarding their knowledge on the use of plant
protection chemicals. The superior group being the irrigated
one.

The farmers of CR area and CNP area were also compared
on this line and the results are furnished in table 27.

The X^2 value indicated no significant difference between these two groups of farmers.

4. Intercropping.

Table 28. Comparison between farmers possessing unirrigated land and irrigated land, with regard to their level of knowledge on intercropping.

Score	Cumulative step function	
	Unirrigated $Sn_1 (x)$	Irrigated $Sn_2 (x)$
0	0/39	0/31
1	3/39	1/31
2	10/39	5/31
3	18/39	6/31
4	25/39	13/31
5	36/39	25/31
6	39/39	31/31

Maximum $Sn_1 (x) - Sn_2 (x) = 0.2680$

$X^2 = 4.9620$ N.S

N.S Not Significant

Table 29. Comparison between the farmers of CR area and
CNP area, with regard to their level of knowledge
on intercropping.

Score	Cumulative step function	
	CR area $Sn_1 (x)$	CNP area $Sn_2 (x)$
0	0/35	0/35
1	3/35	1/35
2	9/35	6/35
3	14/35	10/35
4	20/35	18/35
5	34/35	27/35
6	35/35	35/35

Maximum $Sn_1 (x) - Sn_2 (x) = 0.20$

$X^2 = 2.80$ N.S

N.S Not Significant

The X^2 value computed, indicated that there was no
significant difference between the farmers with irrigated
and unirrigated coconut gardens with respect to their knowledge
on intercropping.

The same result was obtained in the case of the comparison made between the farmers of CR area and CNP area, also.

5. Seedling selection

Table 30. Comparison between farmers possessing unirrigated land and irrigated land, with regard to their level of knowledge on seedling selection.

| Score | Cumulative step function | |
	Unirrigated $Sn_1 (x)$	Irrigated $Sn_2 (x)$
0	0/39	0/31
1	3/39	0/31
2	11/39	2/31
3	22/39	10/31
4	34/39	19/31
5	39/39	31/31

Maximum $Sn_1 (x) - Sn_2 (x) = 0.2589$

$x^2 = 4.6308$ N.S

N.S   Not Significant

Table 31. Comparison between the farmers of CR area and CNP area, with regard to their level of knowledge on seedling selection.

Score	Cumulative step function	
	CR area $Sn_1 (x)$	CNP area $Sn_2 (x)$
0	0/35	0/35
1	2/35	1/35
2	8/35	7/35
3	17/35	15/35
4	26/35	24/35
5	35/35	35/35

Maximum $Sn_1 (x) - Sn_2 (x) = 0.0571$

$x^2 = 0.2282$ N.S

N.S Not Significant

The data furnished in table 30 reveals that the two groups viz. unirrigated and irrigated, did not differ significantly in their level of knowledge on seedling selection.

The x^2 value obtained while comparing the farmers of CR area with the farmers of CNP area, regarding their knowledge on seedling selection was 0.2282. The value was found to be insignificant. This led to the inference that these two groups of farmers had no significant difference between them, as far

as their knowledge on this particular practice was concerned.

B. ATTITUDE.

Comparison between (i) farmers possessing unirrigated land and irrigated land, and (ii) farmers of CR area and CNP area, with regard to their attitude towards each of the improved practices in coconut cultivation.

1. Coconut cultivation

Table 32. Comparison between farmers possessing unirrigated land and irrigated land, with regard to their attitude towards coconut cultivation.

Class interval	Cumulative step function	
	Unirrigated $Sn_1 (x)$	Irrigated $Sn_2 (x)$
12 - 14	1/39	0/31
15 - 17	1/39	0/31
18 - 20	4/39	3/31
21 - 23	21/39	8/31
24 - 26	31/39	15/31
27 - 29	39/39	31/31

Maximum $Sn_1 (x) - Sn_2 (x) = 0.3110$

$x^2 = 6.6818*$

* Significant at 0.05 level

Table 33. Comparison between farmers of CR area and CNP area,
with regard to their attitude towards coconut
cultivation.

Class Interval	Cumulative step function	
	CR area $Sn_1(x)$	CNP area $Sn_2(x)$
12 – 14	1/35	0/35
15 – 17	1/35	0/35
18 – 20	1/35	1/35
21 – 23	14/35	10/35
24 – 26	25/35	15/35
27 – 29	35/35	35/35

Maximum $Sn_1(x) - Sn_2(x) = 0.2857$

$x^2 = 5.7137$ N.S

N.S   Not Significant

A close examination of the figures in table 32, indicates
that the farmers possessing unirrigated land and irrigated land
differed significantly, in their attitude towards coconut
cultivation. Farmers with irrigated land showed a more
favourable attitude towards coconut cultivation.

The comparison made on the grounds of the classification
of the beneficiaries into farmers of CR area and farmers of

CNP area, led to the finding that there was no significant difference between these groups, regarding their attitude towards coconut cultivation. The results obtained are furnished in table 33.

2. Irrigation

Table 34. Comparison between farmers possessing unirrigated land and irrigated land, with regard to their attitude towards irrigation.

Class interval	Cumulative step function	
	Unirrigated Sn_1 (x)	Irrigated Sn_2 (x)
12 - 14	0/39	0/31
15 - 17	1/39	0/31
18 - 20	14/39	7/31
21 - 23	27/39	16/31
24 - 26	29/39	29/31
27 - 29	39/39	31/31

Maximum Sn_1 $(x) - Sn_2$ (x) = 0.1762

x^2 = 2.1449 N.S

N.S Not Significant

Table 35. Comparison between farmers of CR area and
CNP area, with regard to their attitude
towards irrigation.

| Class interval | Cumulative step function | |
	CR area Sn_1 (x)	CNP area Sn_2 (x)
12 - 14	1/35	0/35
15 - 17	1/35	1/35
18 - 20	6/35	15/35
21 - 23	20/35	24/35
24 - 26	34/35	34/35
27 - 29	35/35	35/35

Maximum Sn_1 (x) - Sn_2 (x)   = 0.2571

X^2 = 4.6270 N.S

N.S   Not Significant

As observed from table 34, the X^2 value obtained, proved
that there was no significant difference between the farmers
with unirrigated and irrigated gardens, with respect to their
attitude towards irrigation.

A comparison made on this line, after classifying the
beneficiaries into farmers of CNP area and farmers of CR area,

revealed that these two groups of farmers also did not
differ significantly in their attitude towards irrigation.

3. Use of fertilizers.

Table 36. Comparison between farmers possessing unirrigated
land and irrigated land, with regard to their
attitude towards the use of fertilizers.

| Class interval | Cumulative step function | |
	Unirrigated Sn_1 (x)	Irrigated Sn_2 (x)
12 - 14	0/39	0/31
15 - 17	6/39	1/31
18 - 20	20/39	6/31
21 - 23	30/39	18/31
24 - 26	38/39	29/31
27 - 29	39/39	31/31

Maximum Sn_1 (x) - Sn_2 (x)   = 0.3193

x^2 = 7.0434*

* Significant at 0.05 level

Table 37. Comparison between farmers of CR area and CNP area, with regard to their attitude towards the use of fertilizers.

Class interval	Cumulative step function	
	CR area $Sn_1 (x)$	CNP area $Sn_2 (x)$
12 - 14	0/35	0/35
15 - 17	3/35	4/35
18 - 20	10/35	16/35
21 - 23	22/35	26/35
24 - 26	35/35	32/35
27 - 29	35/35	35/35

Maximum $Sn_1 (x) - Sn_2 (x) = 0.1714$

X^2 = 2.0565 N.S

N.S   Not Significant

The data presented in table 36 clearly indicated the unirrigated group and the irrigated group differed significantly in their attitude towards the use of fertilizers. The X^2 value computed was 7.0434 which was significant at 0.05 level of probability.

Comparison of the farmers of CR area with the farmers of CNP area showed that these two groups did not differ significantly in their attitude towards the use of fertilizers.

The x^2 value here was 2.0565, which was well below the critical level.

Table 38. Comparison between farmers possessing unirrigated land and irrigated land with regard to their attitude towards the use of plant protection chemicals.

Class interval	Cumulative stem function	
	Unirrigated $Sn_1 (x)$	Irrigated $Sn_2 (x)$
12 - 14	0/39	0/31
15 - 17	2/39	2/31
18 - 20	14/39	6/31
21 - 23	29/39	16/31
24 - 26	38/39	29/31
27 - 29	39/39	31/31

Maximum $Sn_1 (x) - Sn_2 (x)$ = 0.2274

x^2 = 3.5725 N.S

N.S   Not Significant

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Table 39. Comparison between farmers of CR area and
CNP area, with regard to their attitude
towards the use of plant protection
chemicals.

| Class interval | Cumulative step function | |
	CR area Sn_1 (x)	CNP area Sn_2 (x)
12 - 14	0/35	0/35
15 - 17	1/35	3/35
18 - 20	10/35	10/35
21 - 23	26/35	20/35
24 - 26	26/35	32/35
27 - 29	35/35	35/35

Maximum Sn_1 (x) - Sn_2 (x) = 0.1714

x^2 = 2.0565 N.S

N.S = Not Significant

While comparing the farmers possessing unirrigated land
with the farmers with irrigated land, the maximum Sn_1 (x) -
Sn_2 (x) value obtained, as shown in table 38 was 0.2274.
The x^2 value computed based on this value was 3.5725, which
was below the critical value, indicating that these two
groups did not differ significantly, with regard to their
attitude towards the use of plant protection chemicals.

A similar result, denying any significant difference, was obtained, while comparing the farmers of CR area, with the farmers of CNP area, as shown in table 39.

5. Intercropping

Table 40. Comparison between farmers possessing unirritaged land and irrigated land, with regard to their attitude towards intercropping.

Class interval	Cumulative step function	
	Unirrigated Sn_1 (x)	Irrigated Sn_2 (x)
12 - 14	0/39	0/31
15 - 17	7/39	0/31
18 - 20	13/39	6/31
21 - 23	30/39	13/31
24 - 26	35/39	25/31
27 - 29	39/39	31/31

Maximum Sn_1 (x) - Sn_2 (x) = 0.3499

x^2 = 8.4581*

* Significant at 0.05 level

Table 41. Comparison between farmers of CR area and CNP area, with regard to their attitude towards intercropping.

Class interval	Cumulative step function	
	CR area $Sn_1(x)$	CNP area $Sn_2(x)$
12 - 14	0/35	0/35
15 - 17	4/35	4/35
18 - 20	10/35	10/35
21 - 23	21/35	23/35
24 - 26	32/35	28/35
27 - 29	35/35	35/35

Maximum $Sn_1(x) - Sn_2(x) = 0.1143$

$x^2 = 0.9145$ N.S

N.S   Not Significant

The groups of farmers with unirrigated and irrigated gardens were found to differ significantly, with respect to their attitude towards intercropping.

As evident from table 41, this was not the same in the case of the comparison made between the farmers of CR area and farmers of CNP area. The x^2 value of 0.9145 computed, indicated vividly, that these two groups had no significant difference, whatsoever, in their attitude towards intercropping.

C. ADOPTION.

Comparison between (i) farmers possessing unirrigated land and irrigated land, and (ii) farmers of CR area and CNP area, with regard to their extent of adoption of each of the improved practices in coconut cultivation.

1. Irrigation.

Table 42. Comparison between farmers of CR area and CNP area, with regard to their extent of adoption of irrigation.

Score	Cumulative step function	
	CR area Sn_1 (x)	CNP area Sn_2 (x)
1	21/35	18/35
2	21/35	19/35
3	35/35	35/35

Maximum Sn_1 (x) − Sn_2 (x) = 0.0857

x^2 = 0.5141 N.S

N.S   Not Significant

The very classification of the beneficiaries into the groups namely, irrigated and unirrigated, itself was based on their adoption of the practice of irrigation. Hence, a comparison between these two groups on this aspect was not required.

However, a comparison made between farmers of CR area and the farmers of CNP area, on this line, proved that these two groups had no significant difference in their adoption of irrigation. The X^2 value of 0.5141 obtained as a result of the test was not significant, as indicated in table 42.

2. Use of Fertilizers.

Table 43. Comparison between farmers possessing unirrigated land and unirrigated land with regard to their extent of adoption of fertilizers.

Score	Cumulative step function	
	Unirrigated $Sn_1(x)$	Irrigated $Sn_2(x)$
1	3/39	0/31
2	17/39	4/31
3	39/39	31/31

Maximum $Sn_1(x) - Sn_2(x)$ = 0.3068

X^2 = 6.5028*

* Significant at 0.05 level

Table 44. Comparison between farmers of CR area and
CNP area, with regard to their extent of
adoption of fertilizers.

Score	Cumulative step function	
	CR area $Sn_1 (x)$	CNP area $Sn_2 (x)$
1	11/35	0/35
2	14/35	9/35
3	35/35	35/35

Maximum $Sn_1 (x) - Sn_2 (x) = 0.3143$

x^2 $= 6.9149*$

* Significant at 0.05 level

The farmers possessing irrigated land was found to be
superior to the unirrigated group in the adoption of fertilizers,
as evident from table 43.

The data in table 44,made clear that the farmers of
CNP area were superior in the use of fertilizers. The x^2 value
of 6.9149 was significant at 0.05 level of probability.

3. Use of plant protection chemicals.

Table 45. Comparison between farmers possessing unirrigated land and irrigated land, with regard to their extent of adoption of plant protection chemicals.

Score	Cumulative step function	
	Unirrigated $Sn_1 (x)$	Irrigated $Sn_2 (x)$
1	2/39	1/31
2	14/39	9/31
3	39/39	31/31

Maximum $Sn_1 (x) - Sn_2 (x) = 0.0687$

x^2 = 0.3261 N.S

N.S   Not Significant

Table 46. Comparison between farmers of CR area and
CNP area, with regard to their extent of
adoption of plant protection chemicals.

Score	Cumulative step function	
	CR area $Sn_1 (x)$	CNP area $Sn_2 (x)$
1	10/35	0/35
2	22/35	12/35
3	35/35	35/35

Maximum $Sn_1 (x) - Sn_2 (x) = 0.2857$

$x^2 = 5.7137$ N.S

N.S   Not Significant

No significant difference was found between the farmers
possessing unirrigated and irrigated coconut gardens, with
respect to the adoption of plant protection chemicals, as
revealed by the data in table 45.

In the case of the comparison made between the farmers of
CR area and CNP area, a X^2 value of 5.7137 was obtained, as
indicated in table 46, which was below the critical value.
This indicated that the two groups did not differ significantly.

7. Intercropping.

Table 47. Comparison between farmers possessing unirrigated land and irrigated land, with regard to their extent of adoption of intercropping.

Score	Cumulative step function	
	Unirrigated $Sn_1(x)$	Irrigated $Sn_2(x)$
1	1/39	0/31
2	18/39	9/31
3	39/39	31/31
Maximum	$Sn_1(x) - Sn_2(x)$	= 0.1712
x^2		= 2.0249 N.S

N.S   Not Significant

Table 48. Comparison between farmers of CR area and CNP area with regard to their extent of adoption of intercropping.

Score	Cumulative step function	
	CR area $Sn_1(x)$	CNP area $Sn_2(x)$
1	0/35	1/35
2	11/35	16/35
3	35/35	35/35

Maximum $Sn_1(x) - Sn_2(x)$ = 0.1429

X^2 = 1.4294 N.S

N.S Not Significant

The Kolmogorov - Smirnov test showed that the two groups viz., unirrigated and irrigated did not differ significantly, with respect to their adoption of intercropping.

The X^2 value computed while comparing the farmers of CR area with CNP area was 1.4294, as presented in table 48, indicating that there was no significant difference between these two groups in the adoption of intercropping.

Table 49. Comparison between farmers possessing unirrigated land and irrigated land, with regard to their extent of adoption of seedling selection.

Score	Cumulative step function	
	Unirrigated $Sn_1 (x)$	Irrigated $Sn_2 (x)$
1	1/39	0/39
2	21/39	8/31
3	39/39	31/31

Maximum $Sn_1 (x) - Sn_2 (x)$ = 0.2804

χ^2 = 5.4318 N.S

N. S Not Significant

Table 50. Comparison between farmers of CR area and CNP area, with regard to their extent of adoption of seedling selection.

Score	Cumulative step function	
	CR area Sn_1 (x)	CNP area Sn_2 (x)
1	1/35	0/35
2	14/35	15/35
3	35/35	35/35

Maximum Sn_1 (x) – Sn_2 (x) = 0.0286

X^2 = 0.0573 N.S

N.S   Not Significant

The comparison made between the two groups, namely, unirrigated and irrigated, led to the finding that these two groups of farmers did not differ significantly in their adoption of the criteria recommended for seedling selection.

A similar result was obtained in the case of the comparison of CR farmers with CNP farmers also, and is presented in table 50. Here the X^2 value obtained was 0.0573 which was well below the critical value, to be significant.

III. Relationship between selected independent variables
    and the level of knowledge, attitude and extent of
    adoption of the respondent farmers.

A. Correlation between knowledge about the improved
   practices of coconut cultivation and the selected
   independent variables of beneficiaries and
   non-beneficiaries.

Relationship of the selected independent variables with

the level of knowledge of farmers on improved practices of

coconut cultivation, was worked out by computing the coefficient

of correlation. The results obtained are presented in table 51.

Table 51. Correlation between the level of knowledge of farmers
and the selected independent variables.

Sl. No.	Independent variables	Correlation coefficients	
		Beneficiaries	Non-beneficiaries
1	Age	-0.1512 N.S	-0.3542**
2	Education	0.8467**	0.8658**
3	Farm size	0.3022*	0.4057**
4	Income	0.4580**	0.4218**
5	Cosmopoliteness	0.6867**	0.3323**

  * Significant at 0.05 level
 ** Significant at 0.01 level
 N.S Not Significant

The computed 'r' value obtained for different variables,

revealed that except age in the case of beneficiary farmers,

all the other variables had significant relationship with the

level of knowledge of both beneficiaries and non-beneficiaries.

Among the variables which had significant relationship with
the level of knowledge, only age in the case of non-beneficiary
farmers had a significant negative relationship. All the other
variables had a positive and significant relationship with the
level of knowledge of farmers. However, age of beneficiaries
had no significant relationship with their level of knowledge.

A close examination of table 51 reveals that the level
of education was the variable which had the highest correlation
with the level of knowledge, of both beneficiaries and non-
beneficiaries.

B. Correlation between attitude towards improved practices of
coconut cultivation and the selected independent variables
of beneficiaries and non-beneficiaries.

The correlation coefficients computed, in this case, are
furnished in table 52.

Table 52. Correlation between the attitude of farmers and the
selected independent variables.

Sl. No.	Independent variables	Correlation coefficients	
		Beneficiaries	Non-beneficiaries
1	Age	-0.2307 N.S	-0.3335**
2	Education	0.7025**	0.8242**
3	Farm size	0.3091**	0.4474**
4	Income	0.4378**	0.4949**
5	Cosmopoliteness	0.7631**	0.3550**

** Significant at 0.01 level
N.S Not Significant

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The computed correlation coefficients indicated that except age in the case of beneficiary farmers, all the other variables had significant relationship with the attitude of both beneficiary farmers and control farmers. Age of beneficiaries had no significant relationship with their attitude towards improved practices of coconut cultivation. Age of non-beneficiaries and their attitude were negatively and significantly correlated. Except in this case, all the other variables which showed a significant relationship, had positive and significant relationship with the attitude of farmers towards improved practices of coconut cultivation. In both the groups of farmers, education showed the highest correlation.

C. Correlation between the extent of adoption of improved practices of coconut cultivation and the selected independent variables of beneficiaries and non-beneficiaries.

The results obtained are presented in table 53.

Table 53. Correlation between the extent of adoption by farmers and the selected independent variables.

Sl. No.	Independent variables	Correlation coefficients	
		Beneficiaries	Non-beneficiaries
1	Age	-0.1666 N.S	-0.3419**
2	Education	0.8073**	0.8074**
3	Farm size	0.3708**	0.3017*
4	Income	0.4616**	0.4073**
5	Cosmopoliteness	0.7397**	0.2708*

* Significant at 0.05 level
** Significant at 0.01 level

The extent of adoption of improved practices of coconut cultivation was found to have significant relationship with all the independent variables except age of beneficiary farmers. Age of beneficiaries had no significant relationship with their extent of adoption. Only age in the case of non-beneficiaries showed a significant negative relationship with the extent of adoption. All the other variables which exhibited a significant relationship with the extent of adoption, had a positive and significant relationship with it. The computed correlation coefficients for education were the highest, here also.

IV. Interrelationship amongst the selected dependent variables of the study.

A. Beneficiaries.

Table 54. Interrelationship amongst the selected dependent variables in the case of beneficiaries.

Sl. No.	Variable	Correlation coefficients		
		Level of Knowledge	Attitude	Extent of Adoption
1	Level of Knowledge	..	0.7114**	0.7731**
2	Attitude	..	..	0.7202**
3	Extent of Adoption	..	..	..

** Significant at 0.01 level

To find out the relationship that the dependent variables had in between them, correlation coefficients were computed.

The computed correlation coefficients indicated a positive and significant relationship between knowledge and attitude; knowledge and adoption; and attitude and adoption in the case of beneficiaries.

B. Non-beneficiaries

Table 55. Interrelationship amongst the selected dependent variables in the case of non-beneficiaries.

Sl. No.	Variable	Correlation coefficients		
		Level of knowledge	Attitude	Extent of adoption
1	Level of knowledge	..	0.8295**	0.7706**
2	Attitude	..	..	0.7404**
3	Extent of adoption	..	..	..

** Significant at 0.01 level

An examination of the data furnished in table 55 reveals that the dependent variables had positive and significant relationships between each other, in the case of non-beneficiaries also.

V. Relationship between credit utilization behaviour and the other variables, of the beneficiaries.

The data obtained as a result of percentage analysis, which depict the relationship between credit utilization behaviour and the other dependent and independent variables are presented in table 56.

Table 56. Relationship between credit utilization behaviour and the other variables, of the beneficiaries.

Variables	Categories	Proper utilization (n = 63)		Improper utilization (n = 7)	
		Frequency	Percentage	Frequency	Percentage
Knowledge	low	14	22.22	4	57.14
	medium	37	58.73	3	42.86
	high	12	19.05	-	-
Attitude	low	5	7.94	4	57.14
	medium	53	84.12	3	42.86
	high	5	7.94	-	-
Adoption	low	10	15.87	6	85.71
	medium	37	58.73	1	14.29
	high	16	24.40	-	-
Age	young	15	23.81	-	-
	middle age	38	60.32	7	100
	old	10	15.87	-	-
Education	low	12	19.05	4	57.14
	medium	39	61.90	3	42.86
	high	12	19.05	-	-

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(contd...)

Table 56 (contd....)

Variables	Categories	Proper utilization (n = 63)		Improper utilization (n = 7)	
		Frequency	Percentage	Frequency	Percentage
Farm size	low	11	17.46	-	-
	medium	30	47.62	7	100
	high	22	34.92	-	-
Income	low	12	19.05	-	-
	medium	40	63.49	7	100
	high	11	17.46	-	-
Cosmopolite-ness	low	12	19.05	5	71.43
	medium	49	77.78	2	28.57
	high	2	3.17	-	-

A close examination of the data presented in table 56 indicates that in the case of farmers who have utilised the credit properly, 19.05% were of the high category in knowledge, 7.95% of the farmers who have utilised the credit properly, were of a high category in attitude, and 24.40% belonged to the high adoption category. In the case of age, 23.81% of the farmers belonging to the category of proper utilization, were young and 15.87% were of the old age group. 19.05% of the farmers belonging to the category of proper utilization were of high education, 34.92% were having a high farm size, 17.46% were of high income and 3.17% of high cosmopoliteness.

In the case of the group of farmers who have utilised the credit improperly, majority of them were of the low category in the variables such as knowledge, attitude, adoption, education and cosmopoliteness. All the farmers who belonged to the category of improper utilizers were of the medium category as far as their age, farm size and income were concerned.

VI. Constraints, as felt by the beneficiaries, in the implementation of the SADU programme.

The constraints ranked after finding out the cumulative index, are presented in table 57, according to their rank order.

The maximum cumulative index was for the constraint: "Intercropping cocoa is not remunerative"; followed by "Lack of sincerity on the part of labourers".

Table 57. Constraints involved in the implementation of the SADU programme.

Sl.No.	Constraint	Cumulative index	Rank
1	Intercropping cocoa is not remunerative	169	1
2	Lack of sincerity on the part of labourers	163	2
3	High labour consumption required following the recommended improved practices	153	3
4	Lack of supply of sufficient good quality seedlings	142	4
5	Procedure for sanctioning loans takes much time	140	5
6	Costs of fertilizers are very high	138	6
7	Lack of proper irrigation facilities	136	7
8	Cost of seedlings is very high	130	8
9	Lack of sufficient transport facilities	128	9
10	Lack of sufficient training camps and seminars	123	10
11	Lack of sufficient storage facilities	115	11.5
12	Low price of nuts	115	11.5
13	Unavailability of sufficient equipment for plant protection	95	13
14	Untimely and inadequate supply of inputs	85	14.5
15	Lack of sufficient supervision and guidance	85	14.5
16	High cost of pumpsets	78	16
17	The cost involved in plant protection is very high	72	17

DISCUSSION

CHAPTER V

DISCUSSION

A detailed discussion of the findings of this study
is presented in this chapter.

I A. Comparison between beneficiaries and non-beneficiaries with
regard to their cumulative scores for knowledge, attitude
and adoption of improved practices in coconut cultivation.

1. Comparison between beneficiaries and non-beneficiaries
with regard to their cumulative scores for knowledge on
improved practices in coconut cultivation.

A comparative analysis of the level of knowledge of
the beneficiaries and non-beneficiaries is presented in
table 4. A close examination of the data indicates that the
beneficiaries of SADU programme possessed a significantly high
knowledge on the improved practices of coconut cultivation. It
is interesting to note that the mean score for knowledge on the
selected improved practices, of the non-beneficiaries was quite
lower than that of the beneficiaries. This may be due to the
progressive nature of the beneficiaries. This also points out
the enthusiasm shown by the beneficiary farmers towards the
programme. The interest and sincerity of the farmers towards
the programme are quite evident.

2. Comparison between beneficiaries and non-beneficiaries, with regard to their cumulative scores for attitude towards improved practices in coconut cultivation.

It is encouraging to note, from the data presented in table 5, that the farmers who were beneficiaries of SADU, had comparatively more favourable attitude towards the improved practices of coconut cultivation. This may be due to their superiority in knowledge, as far as these practices are concerned. The result indicates that the efforts on the part of the officials of SADU, to instil a positive attitude in the farmers, have been fruitful. The financial assistance provided by SADU to the beneficiaries, might have contributed to the development of a more favourable attitude.

3. Comparison between beneficiaries and non-beneficiaries, with regard to their cumulative scores for adoption of improved practices in coconut cultivation.

A perusal of the data presented in table 6, would lead to the conclusion that the extent of adoption of the selected practices, in the case of beneficiaries, was higher than that of the non-beneficiaries. This directly indicates the effictiveness of the programme in convincing the farmers about the utility of the said practices. The higher mean score for adoption, of the beneficiaries, may be an outcome of their high knowledge as well as their favourable attitude.

FIG.2. LEVEL OF KNOWLEDGE, ATTITUDE AND EXTENT OF ADOPTION OF IMPROVED PRACTICES IN COCONUT CULTIVATION BY BENEFICIARIES AND NON-BENEFICIARIES OF SADU PROGRAMME.
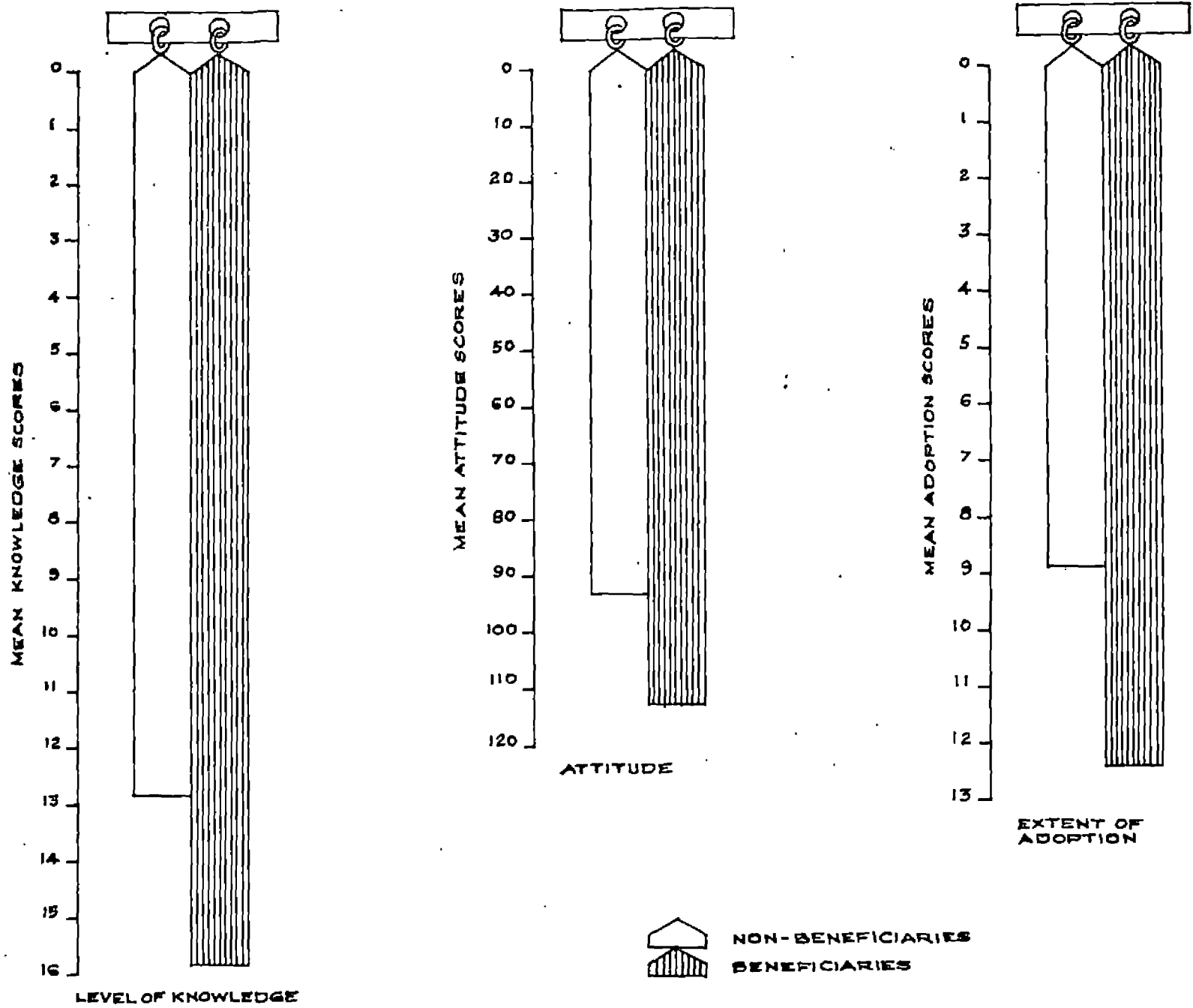
B. Comparison between beneficiaries and non-beneficiaries,
    with regard to their level of knowledge, attitude and
    extent of adoption of each of the improved practices
    in coconut cultivation.

    1. Comparison between beneficiaries and non-beneficiaries,
        with regard to their level of knowledge on each of the
        improved practices in coconut cultivation.

        A comparative analysis of the beneficiaries and
    non-beneficiaries, regarding their mean scores for knowledge
    on each of the selected practices, has been presented in
    table 7 to 11. The practices are irrigation use of ferti-
    lizers, use of plant protection chemicals, intercropping
    and seedling selection. A glance at the results presented
    in these tables indicates that the beneficiaries and
    non-beneficiaries differed significantly in their level of
    knowledge on each of these practices. In all the cases,
    beneficiaries showed higher mean scores. This may be due
    to the progressiveness of the beneficiary farmers, who may
    be in constant contact with the extension machinery of SADU.
    The interest of the beneficiary farmers on the improved
    technology on coconut cultivation, is evident from their
    high level of knowledge on the same.

        SADU takes into account the cost involved in
    practicing irrigation, purchase of fertilizers and chemicals,
    intercropping and the purchase of seedlings while calculating
    the amount of loan for a farmer. In this study, it was seen
    that only 10% of the beneficiaries utilised the credit

improperly. That shows that the majority of farmers have
put the money to proper use. Thus the direct experience
gained by these farmers while practicing the above mentioned
improved practices of cultivation might have contributed
to their superior level of knowledge. Among the control
farmers only a minority were seen to adopt practices like
irrigation, use of fertilizers and the use of plant protection
chemicals. Intercropping was also more scientific in the
case of beneficiary farmers.

2. Comparison between beneficiaries and non-beneficiaries,
   with regard to their attitude towards each of the
   improved practices in coconut cultivation.

Data in tables 12 to 16 provide a comparative
evaluation of the beneficiaries and non-beneficiaries, as far
as their attitude towards each of the selected improved
practices are concerned. The practices considered were
coconut cultivation, irrigation, use of fertilizers, use of
plant protection chemicals, and intercropping. In all of these
areas, the beneficiaries showed comparatively higher mean
scores. The normal test of significance indicated that these
differences were significant. The beneficiaries showed a
significantly higher attitude towards coconut cultivation.
Their attitude towards irrigation, use of fertilizers, use of
plant protection chemicals and intercropping, were also
significantly higher than that of the non-beneficiaries.

This indicate that the programme has been successful
in creating a favourable attitude on the farmers towards the

modern agricultural technology in coconut cultivation.
The profitability of the practices might have been well
conceived by the farmers. This might have led to the
development of a favourable attitude. It is also notable
that the beneficiaries had more access to the scientific
cultivation practices than the non-beneficiaries because of
their frequent contacts with the officials of SADU and the
financial assistance they obtained through this institution.

3. Comparison between beneficiaries and non-beneficiaries,
    with regard to their extent of adoption of each of the
    improved practices in coconut cultivation.

Tables 17 to 21 present before us a comparative picture
of the beneficiaries and non-beneficiaries, in terms of their
adoption of each of the selected improved practices in coconut
cultivation.

Tables 17 to 21 indicate that the beneficiary farmers
had a significantly higher extent of adoption in the case of
irrigation, use of fertilizers, use of plant protection
chemicals and intercropping. This may be due to their higher
mean scores for knowledge on these practices, as well as their
favourable attitude. Thus these findings prove the theory
that knowledge and attitude are pre-requisites for adoption
of a particular practice. The capacity of the beneficiary
farmers to overcome the financial barrier because of the
assistance from SADU, is also worth mentioning. This is
particularly so in the case of irrigation which involves

relatively huge capital investment. The fact that the cost of fertilizers and chemicals, is on the rise, supports this argument.

However, table 21 establishes that the beneficiaries and non-beneficiaries did not differ significantly in their adoption of the criteria for seedling selection. At the same time the categories differed significantly in their knowledge with regard to this practice. This may be due to the fact that sufficient good quality seedlings satisfying all the criteria were not available, and hence, the beneficiaries were not in a position to follow the criteria for seedling selection strictly.

II. Comparison between farmers possessing unirrigated land and irrigated land, as well as, farmers of CR area and CNP area, with regard to their level of knowledge, attitude and extent of adoption of improved practices in coconut cultivation.

A. Comparison between farmers possessing unirrigated land and irrigated land, as well as, farmers of CR area and CNP area, with regard to their level of knowledge on improved practices of coconut cultivation.

1. Irrigation.

The data presented in table 22 indicate that farmers possessing unirrigated and irrigated land differed significantly in their knowledge on irrigation. It is natural that the farmers possessing irrigated land should possess more knowledge on irrigation than the farmers possessing unirrigated land. The experience gained by a farmer practicing irrigation, might
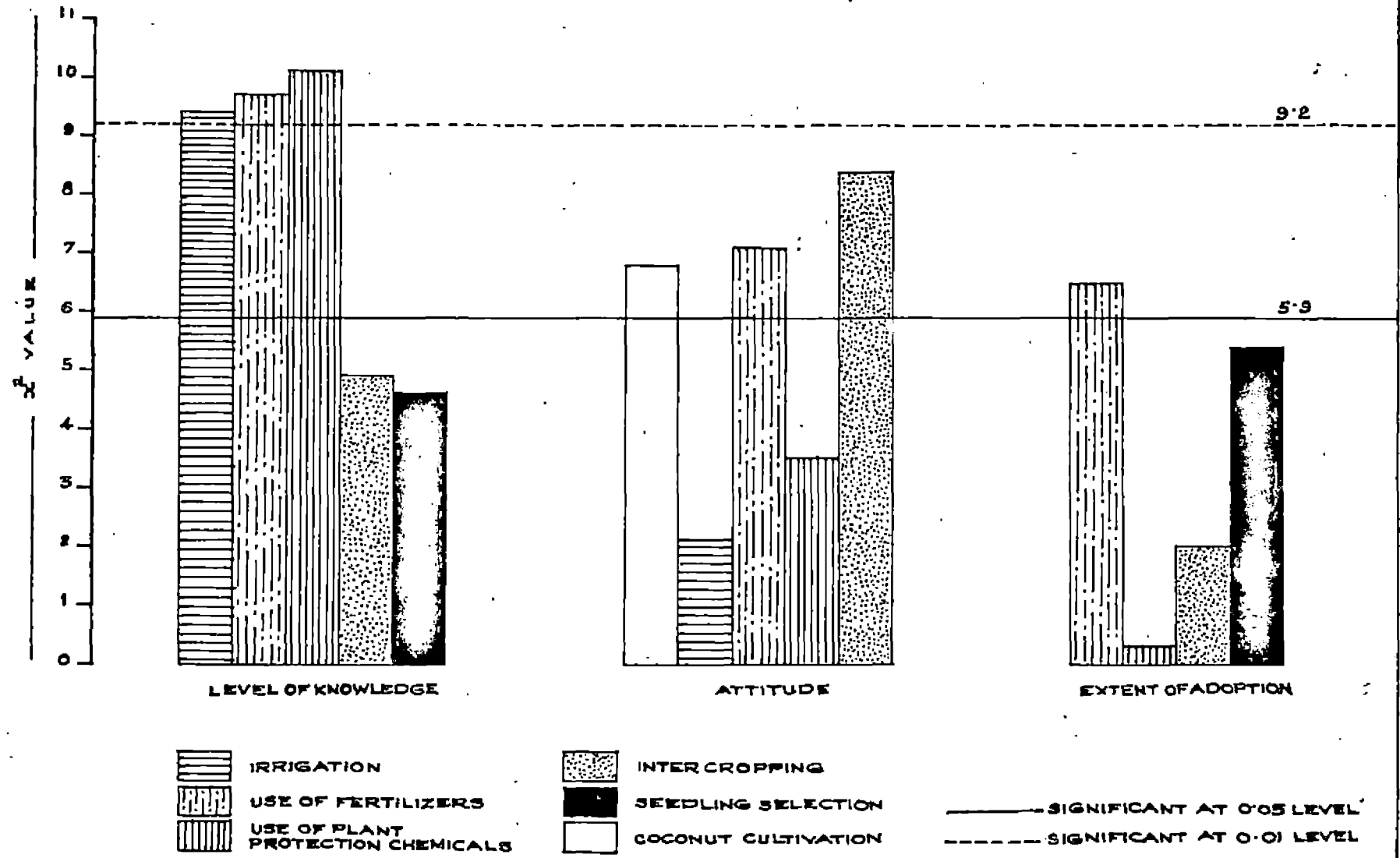
contribute to his knowledge on the particular practice.
The result also points to the emphasis given by SADU to
this practice, and it also indicates the enthusiasm on the
part of the farmers to accept the practice. The increase in
yield that could be obtained by irrigating coconut gardens
is a factor that might have contributed towards the interest
of the farmers on this practice.

However, the result obtained while comparing the farmers
of CR area with the farmers of CNP area, as presented in
table 23, reveals that these two groups of farmers did not
differ significantly in their knowledge on irrigation. This
may be because the farmers of both the areas have been convinced
of the importance and profitability of this practice, and were
equally interested in gathering information on the subject. In
Coconut New Planting area irrigation is quite important for the
young palms planted, and in Coconut Rehabilitation area
irrigation is a practice which could bring about substantial
increase in yields.

2. Use of fertilizers.

The results furnished in table 24 reveal that farmers
possessing irrigated land had a higher level of knowledge on
the use of fertilizers than those with unirrigated land. This
may be because the response to fertilizer application is more
in an irrigated area, and as a result, farmers possessing
irrigated land might be having a comparatively higher interest

FIG.3. COMPARISON BETWEEN BENEFICIARIES POSSESSING IRRIGATED LAND AND UNIRRIGATED LAND WITH REGARD TO THEIR LEVEL OF KNOWLEDGE, ATTITUDE AND EXTENT OF ADOPTION OF EACH OF THE SELECTED PRACTICES.

incidence might have differed markedly in unirrigated and
irrigated coconut gardens of the areas under study, and this
could have led to the present finding depicted in table 26,
as explained above. Chances are that the frequency of pest
and disease occurrence in an irrigated coconut garden is
higher than that in an unirrigated garden. The consciousness
of this fact might have forced the farmers in possession of
irrigated gardens to be more alert and more competent in order
to counter the threat. Thus they may have a tendency to seek
information on this aspect from as much sources as possible.

A glance at the data furnished in table 27, reveals
that the farmers of CR area and CNP area had no significant
difference between them, in their knowledge on the case of
plant protection chemicals. The intensity of pest and disease
occurrence in these two areas of study may be the same, and
this can be accounted to the above finding. The result point
out the chance that the farmers of CR area and CNP area did
not differ in their progressiveness. Even though, the
geographical conditions are a bit different, their outlook
and interest towards farming, as far as coconut cultivation
is concerned, might have remained the same.

4. Intercropping.

Unlike in the previous practice, the farmers possessing
irrigatedland and unirrigated land were found not to differ
in their knowledge on intercropping. In Kerala agriculture,
intercropping of coconut gardens is invariably common among

the farmers of different areas and groups, and the above finding can be justified on the grounds that farmers possessing irrigated and unirrigated gardens might have possessed similar interests on the field, checking the possibility of a difference on their knowledge level on this particular practice.

A close examination of the results in table 29, would lead to the conclusion that farmers of CR area and CNP area did not differ significantly in their knowledge on inter-cropping. This can be attributed to the fact that the pattern of intercropping in these two areas, in coconut gardens, are more or less the same. Tapioca, banana, cowpea etc. are common annual crops cultivated in coconut gardens of both these areas. Cocoa and fodder are the perennial crops seen, intercropped with coconut.

5. Seedling selection.

An observation of the data furnished in table 30, indicates that the farmers belonging to the two groups, namely, those possessing irrigated land and those possessing unirrigated land did not differ significantly, in their level of knowledge on seedling selection. This finding can be recorded as natural on the basis of the fact that good seedling is a must on an irrigated or unirrigated field to yield a good result, and hence, the farmers of either groups may show utmost interest to possess sufficient knowledge on this area.

Table 31 reveals that farmers of CR area and CNP area did not differ significantly in their knowledge on seedling selection. This finding can, therefore, accrue to the same reasoning established above.

B. Comparison between farmers possessing irrigated land and unirrigated land, as well as farmers of CR area and CNP area, with regard to their attitude towards improved practices in coconut cultivation.

1. Coconut cultivation.

A glance at the data in table 32, reveals that farmers possessing irrigated land and farmers possessing unirrigated land, did not differ in their attitude towards coconut cultivation. Being aware of the strong points in adopting improved practices recommended for the cultivation of coconut, the farmers might have developed a positive attitude towards the cultivation of this crop, when compared to the other crops. This directly points to the effectiveness of the programme in imparting a positive attitude among the beneficiary farmers towards the cultivation of this crop.

Table 33 indicates that the farmers of CR area and CNP area also did not differ in their attitude towards coconut cultivation. The same discussion as pointed out above is applicable here also since the farmers, even though, are of different areas, are the beneficiaries of SADU.

2. Irrigation.

The data in table 34 establishes that the beneficiary farmers possessing irrigated and unirrigated coconut gardens,

however, did not differ in their attitude towards irrigation. The beneficiaries were earlier found to possess superior attitude towards the practice when compared with the non-beneficiaries. This indicates that the two groups of farmers might have had a favourable attitude towards irrigation. The farmers possessing unirrigated gardens despite having a favourable attitude might have found it difficult to adopt irrigation due to certain other limiting factors like the lack of electric connections, as is the case with certain areas of Chungathara, which was one of the locations of the present study.

The comparison between the farmers of CR area and CNP area yielded a similar result, as shown in table 35, indicating that these two groups of farmers did not differ in their attitude towards irrigation. In both the programmes, viz., Coconut Rehabilitation and Coconut New Planting, irrigation is given prime importance. The results indicate that these two groups of farmers possess equally favourable attitude towards irrigation. This may be because the SADU officials of these two areas attached due importance to this practice, and were successful in convincing the farmers of the worth of this practice.

3. Use of fertilizers.

The data furnished in table 36 convincingly proves that the beneficiaries possessing irrigated land and unirrigated land, differed significantly in their attitude towards the use of

fertilizers. The farmers possessing irrigated gardens were found to have more favourable attitude towards the use of fertilizers than the others. The result in table 24 had shown that the farmers possessing irrigated coconut gardens were superior in their level of knowledge on this practice. The higher level of knowledge possessed by these farmers might have led to a comparatively higher attitude towards the use of fertilizers. But it is interesting to note that the beneficiaries as a whole had more favourable attitude towards the practice in comparison to the non-beneficiaries.

Table 37 establishes that the farmers of CR area and the farmers of CNP area had no difference in their attitude towards the use of fertilizers. As indicated in table 25 these two groups were not found to differ in their knowledge on the use of fertilizers. This may be the reason for the present result, that these two groups did not differ significantly, in their attitude towards the use of fertilizers.

4. Use of plant protection chemicals.

The data presented in table 38 indicate that there is no significant difference between the farmers possessing irrigated and unirrigated gardens, with regard to their attitude towards the use of plant protection chemicals. This may be because of the equally progressive attitude of the two groups of farmers. Further, it was noted that these two groups and farmers showed no difference in their knowledge on this aspect.

Table 39 reveals that the farmers of CR area and CNP area also did not differ in their attitude towards this particular

practice. The use of plant protection chemicals for the control of pests and disease might be a common practice in both these areas. The practice may be as common in CR area as in CNP area, which might have made the difference in attitude meagre.

5. Intercropping.

The data in table 40 prove that the attitude of farmers possessing irrigated land, was more favourable towards intercropping than the farmers with unirrigated land. This may be due to the difference in productivity of the crops cultivated as intercrops, in an irrigated garden and an unirrigated garden, which can be naturally expected. The irrigated coconut fields provide a more congenial and productive environment to the intercrops, and this more profit could be expected out of them. This might have contributed to the development of a more favourable attitude among the farmers having irrigated land, towards intercropping.

Table 41 presents before us the proof for the fact that farmers of CR area and CNP area did not differ significantly in their attitude towards intercropping. It was earlier concluded from the results furnished in table 29 that they did not differ in their knowledge on their practice also. This may be because of the reason that intercropping was an profitable in CR area, as in CNP area and the farmers of both the areas possessed similar interests on the practice. It is encouraging to note that the beneficiaries, on the whole, differed significantly with the non-beneficiaries on this aspect.

C. Comparison between farmers possessing irrigated land and unirrigated land, as well as, farmers of CR area and CNP area, with regard to their extent of adoption of improved practices in coconut cultivation.

1. Irrigation.

An examination of the data in table 42 indicates that farmers of CR area and the farmers of CNP area did not differ significantly in their extent of adoption of irrigation. The emphasis given to irrigation by SADU in both the programmes viz., Coconut New Planting and Coconut Rehabilitation, is the same. This may be the reason for their similar adoption of this practice, irrespective of the area.

2. Use of fertilizers.

The group of farmers possessing irrigated land, were found to have a higher extent of adoption in the case of this practice. The data presented in table 43 point in this direction. The higher extent of adoption found in the case of farmers possessing irrigated coconut gardens may be because of their higher knowledge and attitude towards this practice.

The farmers of CR area and CNP area were also found to differ significantly in their extent of adoption of this particular practice. The farmers of Coconut New Planting area are concerned with young palms, which require more care and management. Since coconut is cultivated in these areas for the first time, and soil conditions are not known to the

farmers to a required extent, considerable application of fertilizers might have been essential to assure a healthy crop growth.

3. Use of plant protection chemicals.

Table 45 present data which emit the finding that the farmers possessing irrigated gardens did not differ significantly in their adoption of plant protection chemicals, with the farmers possessing unirrigated gardens. Even though, these two groups of farmers differed significantly in their knowledge on the use of plant protection chemicals, they showed no difference in their attitude towards their use. This may be the reason for the lack of difference in their actual use of plant protection chemicals.

It is apparent from the result in table 46 that the farmers of CNP area and the farmers of CR area had no difference in their extent of adoption of plant protection chemicals. This finding is one, which is not beyond the expectations, since these two groups of farmers did not show any significant difference between them, with regard to their knowledge, as well as attitude towards the use of plant protection chemicals.

4. Intercropping.

As evident from table 47, there was no significant difference between the farmers possessing irrigated gardens and farmers possessing unirrigated gardens, with respect to their adoption of intercropping. The monitary assistance

FIG.4. COMPARISON BETWEEN THE BENEFICIARIES OF CR AREA AND CNP AREA, WITH REGARD TO THEIR LEVEL OF KNOWLEDGE, ATTITUDE AND EXTENT OF ADOPTION OF EACH OF THE SELECTED PRACTICES.
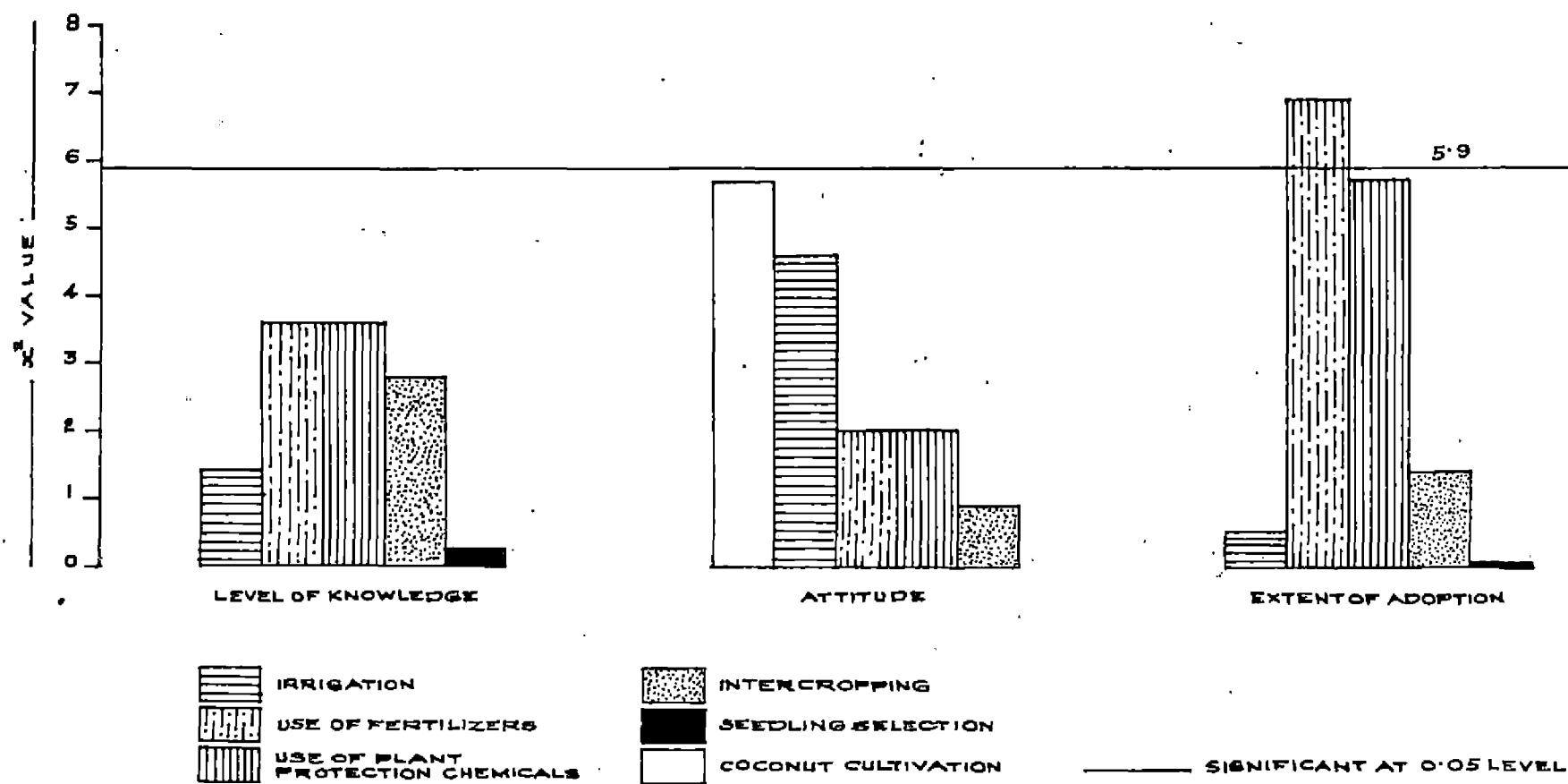
provide by SADU to both the groups of farmers might have
acted as a motivating factor for the adoption of inter-
cropping. It must be remembered that intercropping provides
an additional income to the farmers. Moreover, if fodder
was intercropped it could be effectively utilised in the
maintenance of cattle.

Table 48 illustrates that the farmers of CR area and
CNP area also did not differ in their adoption of inter-
cropping. The same reasoning established above can be
attributed to this result also.

5. Seedling selection.

As shown in table 49, there was no significant
difference between the farmers possessing irrigated coconut
gardens and the farmers possessing unirrigated gardens,
regarding their adoption of the criteria for seedling
selection.

A glance at table 50, reveals that the farmers of
CR area and CNP area also had no difference in their adoption
of the criteria for seedling selection.

In both the cases, the concerned groups were not
found to differ in their knowledge on this aspect, and this
may be the reason for their not showing any difference in
adoption.

III. <u>Relationship between the selected dependent and independent variables of the study.</u>

The results of correlation analysis pertaining to the relationship between the selected dependent and independent variables have been discussed here as follows:

A. <u>Relationship between the level of knowledge on the improved practices of coconut cultivation and the selected independent variables of the beneficiaries and non-beneficiaries.</u>

1. Age

As observed in table 51, age was found to be negatively but non-significantly correlated with the level of knowledge of beneficiaries, and negatively and significantly correlated with the level of knowledge of non-beneficiaries. The comparatively high enthusiasm of the young farmers to go out in search of information and advice,to acquire more knowledge on modernised agriculture might be the contributing factor for this result. As the farmers grow old, they may go low in this enthusiasm. The sensitiveness on the changes that occur every now and then around a person might deteriorate as a result of his aging.

2. Education.

A glance at the data furnished in table 51 reveals that there was significant relationship between education and the level of knowledge of both beneficiaries and non-beneficiaries. This indicates that the level of formal

education helps the farmers in acquiring more knowledge about improved agricultural practices. A literate farmers can be expected to digest more complex technical information. A literate farmer will be in a better position to keep in pace with the rapidly advancing technology, than the less educated farmer. Moreover, an educated farmers can beneficially make use of printed information to increase his knowledge on improved agriculture. He can this supplement the word-of-month communication with the mass media, to enhance his knowledge in the field.

This finding is in line with the findings of Bhaskaran and Mahajan (1968), Supe and Salode (1975), Kaleel (1978), and Ahamed (1981).

3. Farm size.

The 'r' value indicated that there was positive and significant relationship between farm size and the level of knowledge of the beneficiaries as well as the non-beneficiaries. Chances are that, with an increase in the size of holding, the information need also increases. When the farm size is higher, the risk involved also is higher, which will induce the farmers to acquire more knowledge on the improved practices of cultivation. The present finding is in conformity with the findings of Sarkar and Reddy (1980) and Haraprasad (1982)

However, the finding was not in line with that of Supe and Salode (1975).

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4. Income.

As evident from the 'r' value presented in table 51,
there was significant relationship between income and the
level of knowledge of both beneficiaries and non-beneficiaries.
The farmers having a better economic status may have more
access to information sources like radio, newspapers and other
costly publications. Moreover, a farmer having a higher income
is likely to have a comparatively higher size of holding which
may also necessitate him to search for more information.

The present finding was not found to be in agreement
with the findings of Sushama (1979) and also that of Ahamed
(1981).

5. Cosmopoliteness.

In this study, it was found that there was positive and
significant relationship between cosmopoliteness and the level
of knowledge of the beneficiaries and also non-beneficiaries.
The farmer whose orientation is outside his immediate village
is likely to be more knowledgeable about farming practices. He
may have contacts with progressive farmers outside their village,
resulting in an exposure to the pros and cons of the agri-
culture, outside his immediate surroundings. Moreover, a more
cosmopolite farmer may be in a position to make use of more
number of information materials.

This particular result of the present study, is in
conformity with that of Knight and Singh (1975).

B. Relationship between attitude towards improved practices
of coconut cultivation and the selected independent
variables of the beneficiaries and non-beneficiaries.

1. Age.

The results furnished in table 52 reveals that age
was negatively, but not significantly related to the
attitude of beneficiaries and was negatively and signi-
ficantly related to the attitude of non-beneficiaries.
The young farmers are likely to be more progressive in
their outlook and may have a positive orientation towards
change, while older farmers are comparatively conservative
and bogged down to rigidity.

The present finding is in conformity with the findings
of Bose (1961) and Singh and Singh (1968).

2. Education.

The 'r' value indicates that the education of both
beneficiaries and non-beneficiaries had a significant
relationship with their attitude towards improved practices
of coconut cultivation. Formal schooling can instill a
favourable outlook among the farmers towards the modern
methods of agriculture. As the level of literacy increases,
the farmers tend to become more progressive with their
orthodox faith and belief experiencing a set back. The
farmers may be exposed to complex technological advances
in various fields, as the level of literacy goes up, and the
may have a higher level of knowledge.

The finding is in line with the findings of Singh and Singh (1968), Das and Sarkar (1970) and Makkar and Sohal (1974).

3. Farm size.

The data furnished in table 52 is proof to the fact that the farm size of beneficiaries as well as non-beneficiaries was positively and significantly related to their attitude. As the farm size increases, it provides scope for the adoption of improved cultivation practices in a more profitable manner, and this may instill a favourable attitude in the farmer.

The finding is in conformity with that of Das and Sarkar (1970).

4. Income.

The 'r' value computed shows significant positive relationship between income and attitude of both beneficiaries and the non-beneficiaries. A higher income enables the farmers to effectively utilise the print media radio, contact with extension agencies and formal organizations related to agriculture, which may help in acquiring practical information on improved technology. The higher knowledge thus acquired may lead to a higher attitude.

This finding is similar to the findings of Das and Sarkar (1970) and Sushama (1979).

5. Cosmopoliteness.

A glance at the table points out to the fact that cosmopoliteness had a significant and positive relationship with the attitude of beneficiaries and non-beneficiaries. The greater contact with a larger society may broaden the farmers' mental horizon, enhance their level of aspiration and increase their knowledge on the modern techniques of agricultural production. This may help the farmers to have a favourable disposition as far as modern practices of cultivation areconcerned.

The finding of the present study was found to be in conformity with the finding of Kamarudeen (1981).

C. Relationship between the extent of adoption of improved practices of coconut cultivation and the selected independent variables of the beneficiaries and non-beneficiaries.

1. Age.

The 'r' value reveals that there was a negative, but not significant relationship between age and the extent of adoption of the beneficiaries. But age was found to be negatively and significantly correlated with the extent of adoption of the non-beneficiaries. This may be attributed to the higher ventures omeness of the young farmers to adopt innovations in agriculturel

The finding showed conformity with the findings of Wilkening (1952) and Pillai (1978).

2. Education.

It was found that education had a positive and significant relationship with the extent of adoption of beneficiaries and non-beneficiaries. Educational status of the farmers would influence their information seeking behaviour. The more educated farmer will have a higher information seeking behaviour which enhances his knowledge. The higher knowledge leads to a favourable attitude and this in turn may lead to higher adoption.

This finding of the present investigation is in line with the findings of Patel and Singh (1970), Grewal and Sohal (1971) and Sundareswamy and Duraiswamy (1975).

3. Farm size.

The data in table 53 reveal that farm size was positively and significantly related with the extent of adoption in the case of beneficiaries as well as non-beneficiaries. Many of the improved agricultural practices like irrigation, use of fertilizers and plant protection chemicals etc. require some minimum size of land holding for their use. Moreover, a farmer with a larger size of holding can be expected to be more profit oriented, and hence, he may adopt improved agricultural technology, more readily.

The result obtained during this investigation was found to be in agreement with the findings of Hussain (1971), Subramanyam and Lekshmana (1975) and Reddy and Reddy (1977).

4. Income.

An observation of the results furnished in table 53 reveals that the income of both beneficiaries and non-beneficiaries had

significant positive relationship with their extent of
adoption. The farmers with a higher income will have a
higher risk bearing capacity. They may show a readiness
to adopt new practices which may involve high capital
investments.

The above result was found to be in conformity with
that of Hussain (1971), Chandrakandan (1973), Kaleel (1978),
and Pillai (1978).

5. Cosmopoliteness.

The computed 'r' value indicates that there existed
a positive and significant relationship between cosmopolite-
ness of the beneficiaries and non-beneficiaries, and their
extenr of adoption of improved practices in coconut culti-
vation. Higher cosmopoliteness may render the farmers
positive in their attitude towards modern technological
advances, due to their extensive contacts and effective use
of mass media. This in turn, may result in their higher
extent of adoption of improved practices of cultivation.

This finding is congruent to the findings of Kittur
(1976) and Mahadevaswamy (1978).

IV. Interrelationship amongst the dependent variables.

A. Interrelationship amongst the dependent variables of the
beneficiaries.

Table 54 provides factual information, regarding the
positive and significant relationship between knowledge and

attitude; knowledge and adoption; and attitude and adoption. This finding is in line with the theory that knowledge, attitude and adoption are interrelated, and that knowledge and attitude are pre-requisites to adoption. A higher knowledge of the farmers may lead to a favourable attitude, and which in turn, leads to the adoption of a practice.

B. Interrelationship amongst the dependent variables of the non-beneficiaries.

The data furnished in table 55 prove that in the case of non-beneficiaries, there was significant positive relationship between knowledge and attitude, knowledge and adoption, as well as attitude and adoption. This finding is similar to the previous one, and hence, the same reasoning established above can be pointed out here also.

V. Relationship between credit utilization behaviour and the other variables, of the beneficiaries.

1. Level of knowledge.

The data presented in table 56 indicates that majority of the farmers who have properly utilised the credit were of medium level of knowledge, 22.22% of them were of low knowledge and 19.05% were of a high level of knowledge.

Majority of the farmers who have utilised the credit improperly were of the low knowledge category. It is encouraging to note that none of the farmers with a high level of knowledge have utilised the credit improperly. This points to the fact that higher knowledge leads to adoption.

2. Attitude.

A persusal of the data in table 56 made it evident that majority of the farmers who have utilised the credit properly were having a medium level of attitude. 57.14% of the farmers who have utilised the credit improperly were of low level of attitude. Here also, no farmers with a high score for attitude, utilised the credit improperly. This indicates that favourable attitude towards a practice may lead to its adoption.

3. Extent of adoption.

The data reveal that there was 15.87% of farmers in the low adoption category, and 24.40% in the high adoption category, as far as the farmers who have utilised the credit properly, were concerned. Majority (88.71%) of the farmers who have misutilised the credit were of the low adoption category. It is quite encouraging that none of the beneficiary farmers with a high adoption score, utilised the credit improperly. Credit is being disbursed to help the farmers in the adoption of practices, and hence it is natural that improper utilisers of credit had a low adoption score.

4. Age.

An observation of the data in table 56 reveals that 15% of the farmers who have utilised the credit properly were of the middle age group. It is thus interesting to note that all the beneficiary farmers in the young, as well as old, age groups utilised the credit properly.

5. Education.

It is evident from the table that 19.05% of the farmers who have utilised the credit properly were of a higher level of education and 12% were of low level of education. It is again encouraging to note that majority of the farmers who have utilised the credit improperly were of low education category. None with a high level of education utilised the credit improperly. It was however noted earlier that a farmer with a higher level of education showed higher extent of adoption.

6. Farm size.

A critical examination of the data in the table reveals that among the farmers who have utilised the credit properly, 47.62% were having medium farm size and 34.92% were having high farm size. All the farmers in the improper utilization category were having medium farm size. No farmer with a low size of holding or a comparatively high size of holding was found to utilise the credit improperly.

7. Income.

It could be observed that 63.49% of the farmers utilising the credit properly were of medium income group and 17.46% were of the high income group. All the farmers who have utilised the credit improperly, belonged to the medium income category.

8. Cosmopoliteness.

As it is evident from the table, 19.05% of the
farmers who have utilised the credit were of low
cosmopoliteness and 77.78% were of medium, cosmopoliteness.
It is, however, encouraging to note that the majority
(71.43%) of the farmers who have utilised the credit
improperly were of low cosmopoliteness. Only 28.57% of
the group of farmers who have utilised the credit improperly
were of medium cosmopoliteness. None in the high category
utilised the credit improperly, as far as this variable was
concerned. It was earlier noted that cosmopoliteness was
also a contributing factor towards the adoption of improved
practices.

VI. Constraints involved in the implementation of the programme.

The different constraints are presented according
to their order of importance, as felt by the beneficiaries
of SADU, in table 57. The table reveals that the constraint
which ranked first had a cumulative index if 169. The
statement, "Intercropping cocoa is not remunerative", ranked
first. Cultivation of cocoa in coconut gardens was widely
adopted in the past years. The very low price of the produce
in the present day market, might have become a great problem
for the farmers.

Lack of sincerity on the part of labourers was
identified as the constraint, second in the order of

importance. Insincere work of labourers may lead to
substantial economic loss for the farmers. Constantly
increasing wages, may add to the problem.

High labour consumption required for following the
recommended improved practices, was judged as the third
important constraint. Efficient labour, in high amounts,
is required for following the improved practices of coconut
cultivation. In the light of the above problem, the
menace this particular aspect presents to the farmer, can
be deduced.

SUMMARY

SUMMARY

Agriculture, holds the key to the overall economic
development of Kerala, and it has several features which
distinguish it from that in other parts of India. Low
per-capita availability of land, high cropping intensity
and predominance of perennial crops are some of the
special characteristics. Tree crops, mainly coconut,
cashew and rubber, and pepper cover more than 70% of the
area under cultivation in Kerala SADU aims to improve the
productivity of crops like coconut and pepper and thereby
better the economic condition of the farmers.

Empirical evidences, showing how far the technical
and financial assistance provided through SADU is effective
in making its clientele competent in their vocation, are
very limited.

Keeping this in view, this study was undertaken, in
the Special Agricultural Development Unit at Chungathara
and Balaramapuram, with the following objectives:

1. To study and compare the level of knowledge of
   farmers in the project area and non-project area
   on improved agricultural technology on coconut
   development.

2. To study and compare the attitude of farmers of
   the project area and non-project area towards
   improved agricultural technology on coconut
   development.

3. To study and compare the extent of adoption of package of practices recommended by the scheme for the selected crop.

4. To study the relationship between adoption and credit utilization behaviour of the beneficiaries under SADU programme.

5. To study the relationship of personal and socio-economic characteristics of the farmers in relation to their level of knowledge, attitude and adoption of recommended practices.

6. To identify the constraints involved in the implementation of the programme.

A total of seventy beneficiaries were selected from the units taken up for the study. The non-beneficiary farmers were selected from the villages of Mampad and Nemom, the total number equalling that of the beneficiaries. Data were collected with the help of a structured interview schedule developed for the study.

The independent variable selected for the study were (i) age, (ii) education, (iii) farm·size, (iv) income and (v) cosmopoliteness. The relationships of each of these independent variables with the selected dependent variables namely, knowledge, attitude and adoption were established.

Among the beneficiary farmers, those possessing irrigated land and those with unirrigated land were compared with regard to their level of knowledge, attitude and extent of adoption of the improved practices in coconut cultivation. Similarly, the beneficiaries were classified into two groups namely,

farmers of Coconut Rehabilitation (CR) area and farmers of Coconut New Planting (CNP) area, and the two groups were compared regarding their level of knowledge, attitude and extent of adoption.

Credit utilization behaviour of beneficiaries was assessed as proper utilization and improper utilization.

Normal test of significance, simple correlation, Kolmogorov-Smirnov two sample test and percentage analysis were the statistical techniques employed in the study.

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

1. The beneficiaries and non-beneficiaries were found to differ significantly in their cumulative scores for each of the dependent variables viz. level of knowledge, attitude and extent of adoption. A practice-wise comparison made between the two groups showed that they differed significantly in their level of knowledge and attitude towards, all of the selected practices. The beneficiaries and non-beneficiaries differed significantly in their adoption scores for the practices like irrigation, use of fertilizers, use of plant protection chemicals, and intercropping. They did not differ significantly in their extent of adoption of seedling selection.

In all the cases, the beneficiaries had a higher mean score.

2. While comparing the beneficiaries possessing irrigated coconut gardens with those possessing unirrigated

coconut gardens, it was found that the two groups differed significantly in their knowledge on irrigation, use of fertilizers and use of plant protection chemicals. They were not found to differ significantly in their level of knowledge on intercropping and seedling selection.

The farmers possessing irrigated land and unirrigated land were found to differ significantly in their attitude towards coconut cultivation, use of fertilizers, and intercropping. They did not differ significantly in their attitude towards irrigation and use of plant protection chemicals.

These two groups of beneficiary farmers were found to differ significantly in their extent of adoption of only one of the selected improved practices, namely, the use of fertilizers.

3. The farmers of CR area and CNP area did not differ significantly in their level of knowledge on any of the selected practices. Similar results were obtained when they were compared with regard to their attitude also.

But the two groups of farmers were found to differ significantly with the farmers of CNP area being superior in their extent of adoption of fertilizers. They did not, however, differ in their extent of adoption of any of the other practices namely, irrigation, use of plant protection chemicals, intercropping and seedling selection.

4. The independent variable namely, age, was not found to have a significant relationship with the level of knowledge, attitude or extent of adoption, as far as the beneficiaries were concerned. Age of non-beneficiary farmers had a negative and significant relationship with their level of knowledge, attitude and extent of adoption.

Education, farm size, income and cosmopoliteness had positive and significant relationship with the level of knowledge, attitude and extent of adoption of improved practices in coconut cultivation, of beneficiaries and non-beneficiaries.

5. The selected dependent variables showed positive and significant interrelationships among each other, in the case of both beneficiaries and non-beneficiaries.

6. Only 10% of the beneficiaries were found to utilise the credit improperly. No farmer with a high knowledge, attitude or adoption was found to utilise the credit improperly.

7. Four most important constraints felt by the beneficiaries were the following:

 (i) Intercropping cocoa is not remunerative.

 (ii) Lack of sincerity on the part of labourers.

 (iii) High labour consumption required for following the recommended improved practices, and

 (iv) Lack of supply of sufficient good quality seedlings.

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The implications as well as recommendations that emerge out of the findings of the present study can be summarised as follows:

The study revealed that the beneficiaries of SADU were superior in their knowledge, attitude and extent of adoption of improved practices in coconut cultivation. This finding can be considered as a particularly encouraging one, as it points to the effectiveness of the programme in bringing about a substantial positive orientation towards the modern technology in agriculture, among its beneficiaries. Moreover, it indicates the achievement that could be attained by supplementing proper technical supervision and advice with financial assistance. In this context, it can be inferred that the financial backing that the SADU farmers had, might have had a proper say in their superiority in the adoption of improved practices of cultivation. This inference is of value while streamlining future development programmes. Knowledge is an important factor in the decision making process and hence any development programme must take up the process of enhancing the knowledge of farmers as its prime objective, if the adoption of improved practices have to be enhanced.

The relationships established between the selected dependent and independent variables, in this study, would serve as guidelines for the extension agency, for the achievement of its goal. The results may be of help in influencing the adoption behaviour of farmers, favourably.

The beneficiaries of the programme were found to opine that intercropping of cocoa is not a remunerative practice. Under the present circumstances, it would be desirable to reconsider the practice of recommending cocoa as an intercrop.

Lack of supply of sufficient good quality seedlings was identified as an important constraint, by the beneficiaries. For a perennial crop like coconut, a good seedling is a must for a steady and high crop yield. It must be remembered that the supply of the necessary inputs at the correct time and in the best quality is of vital significance in increasing the productivity.

Suggestions for future research.

(i) Similar studies can be undertaken on the pepper development programme implemented through SADU.

(ii) Studies on the repayment behaviour of farmers, can be undertaken in future.

(iii) Studies with technical personnel involved in SADU can be conducted, to assess their perception and employment, pertaining to the programmes implemented by SADU.

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APPENDICES

APPENDIX I

Impact of Special Agricultural Development Units on the
Agricultural Development of Rural Areas in Kerala.

Interview Schedule

Respondent No.   Date:

1. Name of the Farmer:
2. Address:
3. Age:
4. Education: illiterate/can read/can read and write/
   primary/middle/high school/collegeate

5. Farm size:
   total area of garden land.

6. Income (total monthly income)
   a. income from agriculture
   b. others
   c. total

7. Cosmopoliteness.
   a. frequency of visiting the nearest town:
      twice or more times a week/once in a week/once in
      a fortnight/once in a month/never.
   b. purpose of visit:
      agricultural/personal or professional/entertainment/
                              other purposes (specify)
   c. membership in organisation outside the village:
                      Yes/No

A.   Knowledge of farmers on improved agricultural
   technology of coconut.

I.   Irrigation.
     1.   During which of the following months does coconut
          need irrigation, badly?
          a. January - February
          b. April - May
          c. September - October.

2. Which of the following is the best method to irrigate a coconut garden?

    a. pot irrigation
    b. pump irrigation
    c. channel irrigation

3. What should be the frequency of irrigation, during summer months for young palms upto 2 years of age?

    a. once in 4 days
    b. once in 8 days
    c. once in 12 days

II. Use of fertilizers:

1. What is the quantity of organic manure required per tree per year?

    a. 25 kg
    b. 25 - 50 kg
    c. 50 - 75 kg

2. In how many split doses, are fertilizers applied, under rainfed conditions?

    a. 2 split doses   b. 3 split doses   c. 4 split doses

3. In how many split doses, are fertilizers applied, under irrigated conditions?

    a. 2 split doses   b. 3 - 4 split doses   c. 5 - 6 split doses.

4. What is the fertilizer requirement for a palm of 1 year age?

    a. ¼ of the full dose   b. 1/3 of the full dose
    c. ½ of the full dose.

5. Which are the months in which fertilizers are to be applied, if given in 2 split doses?

    a. January - February; November - December
    b. April - May; September - October
    c. July - August; October - November.

III. Use of plant protection chemicals.

1. What is the quantity of BHC and sand used to control Rhinocerous Beetle? (for a single palm)

    a. 100 gm BHC + 100 gm sand
    b. 250 gm BHC + 250 gm sand
    c. 500 gm BHC + 500 gm sand.

2. Which among the following is the kind of sprayer most suited for use in coconut gardens?

    a. Knapsack sprayer   b. Rocker sprayer
    c. Power sprayer

3. Which is the chemical used to inject the trunks of coconut palms, affected by red palm weevil?

a. BHC   b. DDT   c. Pyrocone E.

4. Which among the following, is a fungicide?

a. Fudadan b. Ekalux c. Dithane M-45.

IV. Intercropping.

1. What is the minimum age of coconut palms, between which cocoa can be planted?

a. 15 years   b. 20 years   c. 25 years.

2. Which of the following is a fodder suitable for growing in coconut gardens?

a. Cowpea b. Guinea grass c. Glyricidia

3. Can you identify the crop which demands regular irrigation, when cultivated as an intercrop in coconut gardens?

a. Tapioca   b. Sweet potato   c. Banana

4. Which among the following crops can be grown as an intercrop under unirrigated conditions?

a. Napier grass b. Tapioca c. Banana

5. Which among the following is a perennial crop that can be cultivated as an intercrop in coconut garden?

a. Fodder   b. Banana   c. Pineapple.

6. Which among the following is an annual crop that can be cultivated as an intercrop in coconut gardens?

a. Fodder   b. Banana   c. Cocoa

V. Seedling selection.

1. Coconut seedlings which have not germinated within a period of ...... months after sowing, must be discarded.

a. 4 months   b. 5 months   c. 6 months.

2. What should be the age of seedlings at the time of planting in the main field?

a. 6 - 8 months b. 9 - 12 months c. 13 - 15 months

3. How many leaves should an ideal coconut seedling have?

a. 3 - 5   b. 6 - 8   c. 9 - 11

4. What should be the girth at collar of a good seedling?

a. 6 - 8 cm b. 8 - 10 cm c. 10 - 12 cm

5. Which among the following is the most important character of leaves, which must be looked into, while selecting seedlings?

    a. Lengthy leaves   b. Short leaves
    c. Early splitting leaves.

B. Attitude of farmers towards improved agricultural technology of coconut.
(Indicate the response in the 5 point, continuum viz., Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree).

                                 SA A U D SD

I. Coconut cultivation

1. Coconut cultivation is highly profitable.

2. Coconut cultivation must be given more attention and importance.

3. Coconut is less susceptible to pests and diseases when compared to other crops.

4. The cultivation practices to be followed in the case of coconut are less complex, when compared to many other crops.

5. Coconut cultivation demands for lot of labour.

6. Cost involved in the maintenance of a coconut garden is very high.

II. Irrigation.

1. Irrigating coconut garden helps to obtain constant yields.

2. It is highly profitable to irrigate a coconut garden.

3. Even without irrigation high yields can be obtained from coconut.

4. Irrigating a coconut garden will increase the incidence of pests and diseases.

5. Irrigation helps to reduce the incidence of immature nut fall of coconut.

6. Irrigation helps to improve the soil structure.

III. Use of fertilizers.

1. The yield of coconut can be considerably increased by the use of chemical fertilizers.

2. The use of chemical fertilizers is the best way to increase the yield of coconut.

3. The coconut palm, if supplied with
fertilizers become more susceptible
to pests and diseases.

4. The use of chemical fertilizers make
the soil poor.

5. Application of chemical fertilizers is
a practically useful practice.

6. Use of chemical fertilizers is the
easiest way to increase the yield of
coconut.

IV. Use of plant protection chemicals.

1. Application of plant protection chemi-
cals is a costly affair.

2. It is very difficult to apply plant
protection chemicals.

3. The quality of nuts is reduced due to
application of plant protection chemicals.

4. Application of plant protection chemicals
is an easy way to save the crop from pests
and diseases.

5. Application of plant protection chemicals
have created more pollution problems
rather than solving pest and disease
problems.

6. All coconut cultivators should apply plant
protection chemicals.

V. Intercropping.

1. Intercropping of coconut gardens reduces
the yield from coconut.

2. Intercropping gives rise to competition
for nutrients.

3. Intercropping increases the incidence of
pests and diseases.

4. Intercropping of coconut garden helps to
increase the income of the farmers.

5. The shade in the coconut garden is effe-
ctively utilised through intercropping.

6. Intercropping results in the productive
utilization of land.

C. Adoption of recommended practices.

I. Irrigation.

    1 a. Do you irrigate your coconut garden? Yes/No

      b. If Yes, give the area that you have brought under irrigation.

    2. In the case of new planting area give the member of times you irrigate your coconut garden, per month.

II. Use of fertilizers.

    1 a. Do you apply organic manure to coconut palms?
                                 Yes/No

      b. If Yes, give the quantity of compost/FYM that you apply to a plam per year

                 Young palm
                 Adult palm

    2 a. Do you apply chemical fertilizers? Yes/No

      b. If Yes, give the quantity of fertilizers applied for a palm per year

Fertilizer	Quantity applied	Split doses No. and time

III. Use of plant protection chemicals.

    1 a. Have you noticed any pest/disease attack on the palms?   Yes/No

      b. If Yes, what chemical have you used to control them?

      (i) Name of pest   Name of chemical   Dosage

      (ii) Name of disease   Name of chemical   Dosage

IV. Intercropping.

    1 a. Are you following intercropping in your coconut gardens? Yes/No

      b. If Yes, What are the crops cultivated?

      c. In how much area do you cultivate intercrops? (out of the total area of garden land owned and cultivated)

V. Seedling selection.

    1 a. Do you follow the recommended criteria while selecting coconut seedlings? Yes/No

      b. If Yes, What are the characteristics that you consider while selecting a coconut seedling?

D. Credit Utilization Behaviour.

    1. Have you availed credit through SADU? Yes/No

    2. If Yes, give the unit through which you have availed credit.

    3. Give the purpose: CR/CNP

    4. Give the amount sanctioned

    5. How many instalments were availed so far?

    6. Was at any time, the subsequent instalment denied due to misutilization/partial utilization of the previous instalment? Yes/No

    7. Was the utilization of credit affected in any other way leading to improper utilization?   Yes/No

       If Yes, Specify:

E. Constraints involved in the implementation of the programme.
(Certain problems that the beneficiaries of SADU may encounter with are given below. Indicate how much they are important, as far as you are concerned).

	Most important	Impo- rtant	Least important
1. High labour consumption required for following the recommended improved practices.			
2. Costs of fertilizers are very high.			
3. Cost involved in plant protection is very high.			
4. Lack of sufficient irrigation facilities.			
5. Lack of supply of sufficient good quality seedlings.			
6. Cost of seedling is very high.			
7. Procedure for sanctioning loans takes much time.			
8. Lack of sufficient supervision and guidance.			
9. Untimely and inadequate supply of inputs.			
10. Low price of nuts.			
11. Lack of sufficient transport facilities.			
12. Unavailability of sufficient equipment for plant protection.			
13. Intercropping cocoa is not remunerative.			
14. High cost of pumpsets.			
15. Lack of sufficient storage facilities.			
16. Lack of sufficient training camps and seminars.			
17. Lack of sincerity on the part of labourers.			

APPENDIX II

Criteria recommended for seedling selection
(Package of practices, K.A.U.)

1. Early germination, rapid growth and seedling
vigour.

2. Having 6 - 8 leaves for 10 - 12 months old
seedlings and minimum of 4 leaves for 9 months
old seedlings.

3. 10 - 12 cm, girth at collar.

4. Early splitting of leaves.

IMPACT OF
SPECIAL AGRICULTURAL DEVELOPMENT UNITS
ON THE AGRICULTURAL DEVELOPMENT OF
RURAL AREAS IN KERALA

BY
P. VIJAYA KUMAR

ABSTRACT OF THE THESIS
SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENT FOR THE DEGREE
MASTER OF SCIENCE IN AGRICULTURE
(AGRICULTURAL EXTENSION)
FACULTY OF AGRICULTURE
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DEPARTMENT OF AGRICULTURAL EXTENSION
COLLEGE OF AGRICULTURE
VELLAYANI, TRIVANDRUM

1983

ABSTRACT

The study was conducted in the selected Special
Agricultural Development Units at Chungathara in
Malappuram District and Balaramapuram in Trivandrum
District, of Kerala State, keeping in view the following
objectives:

1. To study and compare the level of knowledge of
   farmers in the project area and non-project area
   on improved agricultural technology on coconut
   development.

2. To study and compare the attitude of farmers of
   the project area and non-project area towards
   improved agricultural technology on coconut
   development.

3. To study and compare the extent of adoption of
   package of practices recommended by the scheme
   for the selected crop.

4. To study the relationship between adoption and
   credit utilization behaviour of the beneficiaries
   under SADU programme.

5. To study the relationship of personal and socio-
   economic characteristics of the farmers in
   relation to their level of knowledge, attitude
   and adoption of recommended practices.

6. To identify the constraints involved in the
   implementation of the programme.

The study revealed that among the respondents, the
beneficiaries as compared to the non-beneficiaries had

significantly higher mean scores for the level of knowledge, attitude and extent of adoption of improved practices in coconut cultivation.

Among the beneficiaries, the farmers possessing irrigated land had a significantly higher knowledge than those with unirrigated land, on irrigation, use of fertilizers, and the use of plant protection chemicals. Also, they were found to have a significantly higher attitude towards coconut cultivation, use of fertilizers and intercropping. The two groups differed significantly in their adoption scores for the use of fertilizers.

Among the beneficiaries, the farmers of Coconut New Planting area showed a significantly higher extent of adoption of fertilizers, when compared to the farmers of Coconut Rehabilitation area. They, however, did not differ significantly in any of the other aspects.

Correlation coefficients indicated that age of non-beneficiary farmers had a negative and significant relationship with their level of knowledge, attitude and extent of adoption of improved practices in coconut cultivation, whereas it had no significant relationship with any of the dependent variables as far as the beneficiaries were concerned. Education, farm size, income and cosmopoliteness had positive and significant relationship with the dependent variables, in the case of both beneficiaries and non-beneficiaries.

The selected dependent variables showed positive and significant interrelationships among each other, in the case of both beneficiaries and non-beneficiaries.

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farmer, with a high score for, knowledge, attitude ption was found to utilise the credit improperly.

Four most important constraints felt by the iciaries, were as follows:

(i) Intercropping cocoa is not remunerative.

(ii) Lack of sincerity on the part of labourers.

(iii) High labour consumption required for following the recommended improved practices, and

(iv) Lack of supply of sufficient good quality seedlings.