A STUDY ON ADOPTION OF SOIL CONSERVATION MEASURES BY FARMERS IN SCHEME AREAS OF TRIVANDRUM DISTRICT

G. BALAKRISHNA PILLAI, B. Sc. (Ag.)

THESIS

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D E C L A R A T I O N

I hereby declare that this thesis entitled " A study on adoption of soil conservation measures by farmers in scheme areas of Trivandrum District " is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship, or other similar title, of any other University or Society.

(G.BALAKRISHNA PILLAI)

Vellayani

4th August, 1978.

C E R T I F I C A T E

Certified that this thesis, entitled " A study on adoption of soil conservation measures by farmers in scheme areas of Trivendrum District " is a record of research work done independently by Sri.G.Balakrishna-Pillai under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship, or associateship to him.

Dr.G.T. NAIR
Chairmen, Advisory Committee,
Associate Professor, College
of Agriculture, Vellayani.

Vellayani
4 August, 1978.

Approved by:

Chairman

Dr. G.T. NAIR

Members

1. Prof. A.G.G. MENON

2. Prof. E.J. THOMAS

3. Sri. P. CHANDRASEKHARAN

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G. BALAKRISHNA PILLAI

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INTRODUCTION

CHAPTER I

INTRODUCTION

Saving the soil by and for the people has been the life-long crusade of Hugh Hammond Bennett who has earned the title of " The Father of Soil Conservation". We live in a world where the two basic resources are the land and the people. The successful combination of human and basic resources determines progress. Soil is the raw material of agriculture - the primary source of its output. Soil constitutes the physical basis of agriculture; it is the progenitor of food, fibre and also the raw material for many industries. Soil lost cannot be restored. This crucial importance of soil renders it's protection and conservation essential. " Soil conservation means applying all the necessary practices to maintain the capability of the land for which it is suited and to improve the productivity of agricultural land". (Report of the working group - IV Plan proposals).

Problems of soil erosion

The top soil is the most vital part of soil for agriculture. Lying at an average depth of about 7 to 8 inches over the face of land, this upper layer of soil is the primary feeding zone of the plants which provide

food for man and beast. However, under different conditions, it is the most unstable of all major natural resources.

Nature takes centuries to form soil through several weathering and soil forming agencies, but man can destroy it in few years by excessive exploitation and unintelligent use. The loss of valuable top soil results in a deterioration of land. Through a slow and gradual process, it is often accelerated by unscientific cultivation and excessive exploitation. When the top soil is lost by erosion, land suffers serious depletion of fertility.

Besides impoverishing and ruining farm land, erosion threatens navigation, power, drainage and irrigation development. Gullies collect rain water and discharge it at maximum speed to channels and streams causing floods. Excessive run off during the rainy season also causes floods. In many parts of the country, the effects of the drought on plant life have been greatly aggravated by progressive soil removal.

As matters now stand, control of erosion is the first and most essential step in the direction of correct land

utilisation. A good portion of valuable agricultural land will become severely impoverished through erosion unless adequate protection is provided. This progressive impoverishment, if permitted to continue unchecked, eventually reduces the fertile area of the farm land considerably. Thus soil erosion constitutes a land problem of enormous importance not only for individual farmers but also for the entire society.

Problem in Kerala

The problem of soil conservation is of particular importance in Kerala where an explosive increase in population has cut the per capita availability of cultivable land to 30 cents and land actually cultivated to 25 cents. On account of the unfavourable man-land ratio, the bulk of arable land has not only been over cropped but grass lands have been over grazed and the trees and forests cut down beyond safe limits. People have tried to exploit the land without treating it with adequate manures and fertilizers. The result of all these has been the unscientific cropping pattern which also leads to impoverishment of the soil.

The soil erosion problem is severe in Kerala because a major portion of the cultivable area has undulating to

steep terrain. Intensity of rainfall is high in Kerala, which also leads to soil erosion. The average rainfall varies from 2500 to 3000 m.m. or even more.

Soil erosion has effected adversely the agricultural production and consequently food deficites in the state has become a regular feature. Erosion has also resulted in the silting up of reservoir of hydro-electric projects. Excessive run-off of the water during the rainy season also causes floods which destroy crops and other property, inflicting heavy losses every year. The magnitude of the problem of erosion is so high in Kerala so that effective soil conservation measures have to be given top priority in Agriculture.

Out of the total area of nearly 38.59 lakhs hectares in Kerala, about 13.93 lakhs hectares from forests, uncultivable waste and land put to non-agricultural uses. The remaining area of about 24.66 lakhs hectares are under cultivation, permanent pastures, cultivable waste and miscellaneous tree crops. Of this area, about 5.00 lakhs hectares are under cereals, which lands are of fairly flat topography. A major portion of the remaining area (about 19.66 lakhs hectares) have undulating to steep

terrain. It is roughly estimated that at least one third to one half of the 19.66 lakhs hectares is highly vulnerable to soil erosion hazards, requiring effective soil con servation measures. In addition, nearly 2.43 lakhs hectares are under River Valley Projects which also require soil conservation works. Thus, the total extent of area requiring effective soil conservation measures in the state is roughly estimated to be about 10 lakhs hectares.

Soil conservation efforts in Kerala

Concerted and scientific attempts to fight erosion and conserve the soil were made only towards the close of the First Five Year Plan when a separate Department of Soil Conservation started functioning earnestly in the erstwhile Travancore-Cochin in 1954.

With the re-organisation of the States and the formation of the present Kerala State in 1956, the soil conservation work was taken over by the department of Agriculture - the soil conservation department was merged into it. In December 1963, however, the soil conservation department came into being and this led to the acceleration of the tempo of soil conservation

activities in the State. In March 1969, the soil conservation department was merged with the department of agriculture and allowed to continue as a separate independent wing under the Director of Agriculture.

Till 1964, the formulation and implementation of the soil conservation programmes were governed by the Travancore-Cochin Land Development Act of 1950 and the Madras Land Development Act of 1949. The Kerala Land Development Act Number 17 of 1964 assimilated into it the relevant provisions of the above two enactments. This act has unified and amended the laws and regulations relating to the preparation and execution of Land Development Schemes including schemes for soil conservation and development of soil resources, the control and prevention of soil erosion and the reclamation of waste lands in the State of Kerala.

A major part of the activity of soil conservation programme in the State is implementation of integrated soil conservation schemes in arable lands. Soil conservation schemes are always taken up on water shed-basis as per the provisions of the Kerala Land Development Act of 1964. Scheme areas are selected on priority basis and schemes processed as per the provisions of the Act.

Technical and financial assistance are provided to the beneficiaries of the scheme areas by the soil conservation unit. 75 per cent of the total cost of the contour bunds is paid as loan to farmers and the remaining 25 per cent paid as subsidy. The loan portion is to be repaid in 15 equal annual instalments with interest at the existing rates.

Progress achieved in the execution of soil conservation schemes

Out of the total area of nearly 10 lakhs hectares of land where soil con servation works are urgently required, only an area of roughly 52,000 hectares have been covered by contour bunding works till date.

The achievements of the Department in soil conservation programmes during the plan periods are given below in table 1 which gives an indication that more progress in the execution of soil conservation works has to be achieved in order to protect the vulnerable areas from the hazards of erosion.

Table 1

Achievements of the Department in Soil Conservation programme in Kerala

Achievements

Period	Physical (Area in hectares)	Financial (Rs.in lakhs)
I Plan	1,140	1.77
II Plan	11,472	17.47
III Plan	31,948	112.07
Annual Plan (1966-'69)	15,726	151.48
IV Plan	11,675	170.01
V Plan till date (From 74-75 to 77-78)	2,590	66.78

Source: Department of Agriculture (Soil Conservation Unit)

Need for the study

Concerted attempts to conserve the soil fertility have been made recently by implementing integrated soil conservation schemes in vulnerable cultivable areas.

But, the progress of coverage of areas has to be expedited in order to check soil erosion in the highly vulnerable areas. Even in scheme areas selected for execution of soil conservation works with departmental assistance, all the farmers do not take up the required soil conservation works. Among the scheme areas in Trivandrum District comprising of a total workable area of 16965 acres, only an area of 7251 acres has been covered by the department by contour bunding works. Thus, it is seen that the percentage of coverage in scheme areas was only 42. The number of non-adopters of soil conservation practices in scheme areas is not negligible. This means that effective soil conservation measures could not be implemented in all areas of the projects for certain reasons. It is necessary to investigate into those reasons of non-adoption to have definite guidelines in implementing effectively the different soil conservation programmes.

Another aspect which is very important is that many of the land owners have not taken up the required Agronomy and Agrostology practices eventhough they complete the contour bunding works. Soil conservation

measures become fully effective and promote maximum soil capacity only if these are supported by suitable farming practices such as crop rotation, contour cultivation, strip cropping, cover cropping and such agronomic practices. So also, providing grass cover on top of contour bunds and such agrostologic measures are also essential to make the soil conservation programme complete. In a study of the State Planning Board (evaluation series number 4 of June 1970) it has been observed that no serious attempt has been made to educate the farmers on such practices. The rate of adoption of these practices has to be studied along with the reasons for non-adoption. A detailed study was essential to understand all these aspects of adoption of soil conservation practices. This study was an effort in that direction.

Specific objectives

The study was undertaken with the following specific objectives:-

1. To study the extent of adoption of recommended soil conservation measures.

2. To study the reasons for non-adoption or partial adoption of recommended soil conservation measures.

3. To study the relationship between adoption of recommended soil conservation practices and socio-personal characters of farmers.

Scope and limitations of the study

The study has been made in Trivandrum District of Kerala State. Considering the limited time and resources at the disposal of the investigator, only a small sample from Trivandrum District was selected for the study. It was hoped that this sample would suffice for obtaining a general picture of the nature of adoption of soil conservation measures in scheme areas of Trivandrum District.

The study will throw light on the extent of adoption of recommended soil conservation measures, reasons for non-adoption or partial adoption of the recommended soil conservation measures and the factors influencing adoption. The findings may help the soil conservation workers in formulating more effective soil conservation programme. The knowledge about socio-personal factors influencing

adoption may help the extension workers to approach the people in correct perspective for better results.

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

Review of related researches in the particular area of study helps the research worker to locate the problem in some theoretical perspective and link it with whatever findings exist in the area of enquiry. It will acquaint the research worker with the various expirical procedures used and also provide a basis for interpretation of the findings.

In this chapter, studies related to adoption of improved agricultural practices are reviewed. Only very few studies in the adoption of soil conservation measures have been reported. The findings of studies on adoption of other practices can be applicable in this study also.

The review is presented in three parts. The first part is the review of the studies on the influence of the variables on adoption of improved agricultural practices in general. The second part reviews the selected variables and their effect on adoption behaviour. The third part reviews the studies on adoption of soil conservation measures.

A. Influence of the variables on adoption of improved agricultural practices in general.

A summary of the review of studies mainly conducted in India on the influence of different variables on adoption of farm practices is presented in Table 2 given below:-

Table 2

Summary of the review of studies on the influence of different variables on adoption of farm practices.

Sl. No.	Name of variable	Name of Researcher/ Researchers	Year	Relationship of the variable with adoption
1	2	3	4	5
1	Compatibility of a new idea.	Hodgdon and Singh.	1963	Not significant
		Danda and Danda	1968	Positive influence
2	Complexity	Singh	1965	Not significant
		Singh and Warlow	1966	Significant
		Danda and Danda	1968	Not significant

1	2	3	4	5
3	Triability of innovation	Singh and Warlow	1966	Positively related
		Danda and Danda	1968	Not significant
4	Observability of the innovation.	Havens and Rogers	1961	Positively related.
		Singh and Warlow	1966	Positively related
5	Degree of communication integration	Yadav	1967	Positively related
6	Age	Wilkening	1952	Negative influence
		Anderson	1955	Negative influence
		Copp	1956	Negative influence
		Chattopadhaya	1960	Not significant
		Bose	1960	Not significant
		Rahim	1961	No relationship
		Rao	1961	No relationship
		Reddy	1962	No relationship
		Bakshi	1962	Positive relation
		Khan	1964	Positive relation
		Jain	1965	No relationship
		Bose and Saxena	1965	No relationship

1	2	3	4	5
6	Age	Bhasin	1966	Not significant
		Bhatia	1966	Not significant
		Gupta	1966	Not significant
		Rao	1966	Not significant
		Singh	1966	Not significant
		Mahajan	1966	No relationship
7	Education	Potti	1960	Positive relation
		Bose	1960	Positive relation
		Rahudkar	1961	Positive relation
		Rahudkar	1962	Positive relation
		Reddy	1962	Positive relation
		Bhalshy	1962	Positive relation
		Das Gupta	1962	Positive relation
		Sinha and Yadav	1964	Positive relation
		Ahmed	1964	Not supporting
		Jain	1965	Not supporting
		Bhasin	1966	Positive relation
		Gupta	1966	Positive relation
		Mahajan	1966	Positive relation
		Mookherji and Singh	1966	Positive relation
		Das Gupta	1966	Not supporting
		Shetty	1966	Not supporting
		Verma	1966	Not supporting
		Singh and Pardasami	1967	Not supporting

1	2	3	4	5
8	Literacy	Rahim	1961	Positive relation
		Bose	1961	Not supporting
		Bose and Das Gupta	1962	Positive relation
		Bose	1964	Positive relation
		Bose and Saxena	1965	Positive relation
		Singh and Reddy	1965	Positive relation
		Chaudhary and Maharaja	1966	Positive relation
		Das Gupta	1966	Not supporting
		Desai and Sharma	1966	Not supporting
		Roy	1967	Positive relation
		Reddy and Kivlin	1968	Positive relation
9	Social status	Ayar	1952	Significant, positively related.
		Desay	1956	Significant, positively related.
		Rahudkar	1958	Positively related
		Rahim	1961	Significant, positively related
		Bose	1961	Significant, positively related.
		Rao	1961	Positively related
		Bose	1961	Not supporting

1	2	3	4	5
9	Social status	Bose and Das Gupta	1962	Significant, positively related.
		Rahudkar	1962	Not supporting
		Reddy	1962	Positively related
		Roy	1963	Significant, positively related.
		Das Gupta	1963	Significant, positively related.
		Ahmed	1964	Significant, positively related.
		Bose	1964	Significant, positively related.
		Sinha and Yadav	1964	Positively related
		Bose	1964	Not supporting
		Bose and Saxena	1965	Significant, positively related.
		Jain	1965	Significant, positively related.
		Singh	1965	Positively related
		Singh and Reddy	1965	Positively related
		Bhatia	1966	Significant, positively related
		Bhasin	1966	Significant, positively related.
		Chaudhary and Maharaja	1966	Significant, positively related.

1	2	3	4	5
9	Social Status	Das Gupta	1966	Significant, positively related
		Mukherjee and Singh	1966	Significant, positively related.
		Prasada	1966	Significant, positively related.
		Singh	1966	Positively related
		Varma	1966	Positively related
		Bhatia	1966	Not supporting
		Chaudhary and Maharaja	1966	Not supporting
		Das Gupta	1966	Not supporting
		Desai and Sharma	1966	Not supporting
		Mukherjee and Sinha	1966	Not supporting
		Shetty	1966	Not supporting
		Verma	1966	Not supporting
		Singh and Pardasami	1967	Not supporting
		Singh	1967	Not supporting
		Singh	1967	Positively related
		Roy	1967	Positively related
		Rajagopalan and Singh	1967	Positively related
		Reddy and ot Kivlin	1968	Positively related
		Roy and others	1968	Positively related

1	2	3	4	5
9	Social status	Reddy and Kivlin	1968	Not supporting
		Danda and Danda	1968	Significant, positively related.
10	Social mobility	Cohen	1962	Positive relation
		Robertson	1967	Positive relation
11	Farm size	Rahudkar	1958	Positively related
		Bhosale	1960	Not supporting (no relation)
		Rahudkar	1961	Positively related
		Rahudkar	1961	Not supporting (no relation)
		Rahudkar	1962	Not supporting (no relation)
		Reddy	1962	Positively related
		Bakshi	1962	Positive relation
		Das Gupta	1963	Positive relation
		Dhaliwal	1963	Positive relation
		Pandit	1964	Positive relation
		Sinha and Yadav	1964	Positively related
		Bose and Saxena	1965	Positive relation
		Dhara	1965	Positive relation
		Jain	1965	Positive relation
		Mulay and Ray	1965	Positive relation
		Singh	1965	Positively related

1	2	3	4	5
11	Farm size	Singh and Reddy	1965	Positively related
		Singh	1965	Not supporting (no relation)
		Gupta	1966	Not supporting (no relation)
		Desai and Sharma	1966	Not supporting (no relation)
		Bhasin	1966	Not supporting (no relation)
		Singh	1966	Positively related
		Shetty	1966	Positively related
		Rao	1966	Positively related
		Bhasin	1966	Positive relation
		Chaudhary and Maharaja	1966	Positive relation
		Gupta	1966	Positive relation
		Mahajan	1966	Positive relation
		Thakur	1966	Positive relation
		Chaudhary	1967	Positive relation
		Rai	1967	Positive relation
		Rajagopalan and Singh	1967	Positively related
		Roy	1967	Positively related
		Singh	1967	Positively related
		Singh and Pardasami	1967	Positively related

1	2	3	4	5
11	Farm size	Singh	1967	Not supporting (no relation)
		Malya and Madappa	1967	Not supporting (no relation)
		Singh and Pardasami	1967	Not supporting (no relation)
		Singh	1968	Not supporting (no relation)
		Roy and others	1968	Not supporting (no relation)
		Dande and Dande	1968	Not supporting (no relation)
		Roy and others	1968	Positively related
		Reddy and Kivlin	1968	Positively related
		Chandrasekharan and Subramoniam	1975	Positive relation
12	Credit facilities	Singh	1961	Positive
		Singh	1967	Positive
		Reddy and Kivlin	1968	No relationship
13	Commercial orientation	Ramsey and Others	1959	Not supporting
		Das Gupta	1966	Not supporting
		Das Gupta	1966	Positive relation
		Moulik and Others	1966	Positive relation

1	2	3	4	5
14	Attitude towards credit	Ramsey and Others	1959	Positive
		Bose	1962	Positive
		Das Gupta	1966	Positive
		Reddy and Kivlin	1968	Not supporting
15	Poverty of farmer	Singh	1961	Negative
		Sahay	1961	Negative
		Jaiswal and Singh	1968	Negative
16	Attitude	Singh	1961	Positive
		Narayan	1965	Positive
		Singh	1966	Positive
		Thakur	1966	Positive
		Singh	1968	Positive
		Sharma and Nair	1969	Positive
17	Empathy	Narang	1966	Not supporting
		Roy	1967	Positive relation
		Kivlin	1968	Positive relation
		Roy and others	1968	Positive relation
		Reddy and Kivlin	1968	Not supporting
18	Dogmatism	Chattopadhyaya	1963	Negative relation
		Mulay and Roy	1965	Not supporting
		Bhasin	1966	Not supporting
		Chattopadhyaya	1967	Not supporting
		Singh and Beal	1967	Negative relation
		Chattopadhyaya	1967	Negative relation

1	2	3	4	5
19	Rationality	Dean and Others	1958	Positive relation
		Ramsey and Others	1959	Not supporting
		Bose	1962	Positive relation
		Bose	1963	Positive relation
		Bose	1964	Positive relation
20	Intelligence	Rogers	1962	Positive relation
		Daspurohit	1963	Positive relation
21	Attitude towards change	Bose	1962	Positive relation
		Chattopadhyaya	1963	Positive relation
		Bose	1963	Not supporting
		Jain	1965	Not supporting
		Dasgupta	1966	Positive relation
		Gupta	1966	Positive relation
		Moulik and others	1966	Positive relation
		Rao	1966	Positive relation
		Chattopadhyaya	1967	Positive relation
		Chattopadhyaya and Pareek	1967	Positive relation
		Singh and Pardaeami	1967	Positive relation
		Kivlin	1967	Not supporting
		Reddy and Kivlin	1968	Positive relation

1	2	3	4	5
22	Favourable attitude towards risk	Ramsey and Others	1959	Positive relation
		Sinha and Yadav	1964	Positive relation
		Singh	1966	Positive relation
		Desai and Sharma	1966	Not supporting
		Prasada	1966	Not supporting
		Singh and Beal	1967	Not supporting
		Reddy and Kivlin	1968	Positive relation
23	Favourable attitude towards science.	Bose	1963	Not supporting
		Bose	1963	Positive relation
		Singh and Reddy	1965	Positive relation
		Anand	1966	Not supporting
		Beal and Others	1967	Positive relation
		Singh and Beal	1967	Positive relation
		Reddy and Kivlin	1968	Not supporting
24	Achievement motivation	Ramsey and Others	1958	Positive influence
		Chattopadhyaya	1965	Positive influence
		Roy	1967	Positive influence
		Beal and Others	1967	Not supporting
		Roy and Others.	1968	Not supporting

1	2	3	4	5
25	High aspiration (for education, occupation and so on)	Gupta and Others	1959	Positive influence
		Singh	1966	Positive influence
		Narang	1966	Not supporting
		Singh	1966	Not supporting
		Chattopadhyaya	1967	Positive influence
		Chattopadhyaya and Pareek	1967	Positive influence
		Roy	1967	Positive influence
		Reddy and Kivlin	1968	Not supporting
26	Social participation	Rahudkar	1961	Positive influence
		Bose	1961	Not supporting
		Reddy	1962	Not supporting
		Bose and Das Gupta	1962	Positive influence
		Das Gupta	1963	Positive influence
		Purohit	1963	Positive influence
		Bose	1964	Positive influence
		Sinha and Yadav	1964	Positive influence
		Bose	1964	Not supporting
		Bose and Saxena	1965	Positive influence
		Singh	1965	Positive influence
		Singh and Reddy	1965	Positive influence
		Bhasin	1966	Positive influence
		Bhatia	1966	Not supporting

1	2	3	4	5
26	Social participation	Das Gupta	1966	Not supporting
		Gupta	1966	Not supporting
		Roy	1967	Positive influence
		Singh	1967	Positive influence
		Gupta	1968	Positive influence
		Reddy and Kivlin	1968	Positive influence
		Roy and Others	1968	Not supporting
		Vyas et al.	1969	Positive influence
		Sundaraswamy	1971	Positive influence
27	Cosmopoliteness	Beal and Rogers	1958	Positive influence
		Das Gupta	1963	Positive influence
		Dhaliwal	1963	Positive influence
		Pathik	1963	Positive influence
		Sinha and Yadav	1964	Positive influence
		Das Gupta	1965	Positive influence
		Dhara	1965	Positive influence
		Singh	1965	Positive influence
		Das Gupta	1965	Not supporting
		Prasada	1966	Not supporting
		Verma	1966	Postive influence
		Rahadkar	1966	Positive influence
		Das Gupta	1966	Positive influence
		Bhatia	1966	Positive influence
		Singh	1967	Positive influence
		Beal and Others	1967	Not supporting

1	2	3	4	5
28	Change agent contact	Rahudkar	1962	Positive influence
		Dhaliwal	1963	Positive influence
		Saxena	1963	Not supporting
		Bose	1964	Not supporting
		Das Gupta	1965	Positive influence
		Dhara	1965	Positive influence
		Bhasin	1966	Positive influence
		Bhatia	1966	Positive influence
		Das Gupta	1966	Positive influence
		Verma	1966	Positive influence
		Das Gupta	1966	Not supporting
		Roy	1967	Positive influence
29	Exposure to massmedia communication channels	Jain	1963	Not supporting
		Bhasin	1966	Not supporting
		Mahajan	1966	Not supporting
		Rao	1966	Not supporting
		Roy	1967	Positive influence
		Beal and Others	1967	Positive influence
		Reddy and Kivlin	1968	Positive influence
		Roy and Others	1968	Positive influence
		Reddy and Kivlin	1968	Not supporting

1	2	3	4	5
30	Exposure to inter-personal communi-cation channels	Dhaliwal	1963	Positive influence
		Jain	1963	Positive influence
		Gupta	1966	Not supporting
		Satyanarayana	1967	Positive influence
		Arndt	1968	Not supporting
31	Knowledge of innovations	Koya	1962	Positive influence
		Bose	1964	Positive influence
		Sinha and Yadav	1964	Positive influence
		Rahim	1964	Not supporting
		Singh	1965	Positive influence
		Mulai and Roy	1965	Positive influence
		Bhasin	1966	Positive influence
		Rai	1967	Positive influence
		Beal and Others	1967	Not supporting
		Reddy and Kivlin	1968	Positive influence
		Roy and Others	1968	Positive influence
		Singh	1968	Positive influence
		Parameswaran	1973	Positive influence
32	Opinion leadership	Rahudkar	1960	Positive influence
		Das Gupta	1966	Positive influence
		Nerang	1966	Not supporting
		Yadav	1967	Not supporting
		Singh	1967	Positive influence
		Roy	1967	Positive influence

1	2	3	4	5
33	Income	Sahay	1961	Positive
		Jaiswal and Singh	1968	Positive
		Sundaraswamy	1971	Positive
		Duraiswamy and Radhakrishna-Menon	1975	Positive
		Raju	1975	Positive
34	Initial cost	Roy	1960	Negative
		Singh	1961	Negative
		Rai	1967	Negative
35	Contact with extension agency	Singh	1966	Positive
		Thakur	1966	Positive
		Jaiswal and Singh	1968	Positive
36	Availability of materials	Choudhary	1967	Positive
		Rai	1967	Positive
		Jaiswal and Singh	1968	Positive
37	Profitability	Roy and Jaiswal	1969	Positive
		Chandrasekharan and Subramoniam	1975	Positive
38	Simplicity	Roy and Jaiswal	1969	Positive influence
		Chandrasekharan and Subramonian	1975	Positive influence

1	2	3	4	5
39	Irrigation facility	Roy	1960	Positive influence
		Choudhary	1967	Positive influence
		Jaiswal and Singh	1968	Positive influence

The above review reveals that adoption is an multi-variable phenomenon and that unless the different variables that are related with adoption are studied together, we cannot get a complete and true picture of adoption. It can also be seen from the above review that different researchers have obtained different types of relationships with the same variables in different situations. This review helped the researcher to identify the important variables to be considered while studying the adoption of soil conservation measures.

B. Detailed review of the selected variables and their effect on adoption.

Dependent variable.

Adoption

The term adoption has been applied to acceptance and

use of improved practices. According to Rogers (1964) adoption is a decision to continue full use of an innovation. This definition implies that an adopter is satisfied with the innovation. Ramsey et al. (1959) postulated that adoption behaviour involves two components: behavioural and cognitive. Behavioural adoption involves the actual use of the practices and cognitive adoption includes obtaining knowledge and and critical evaluation of the practices in terms of the individual situations. Ghattopadhyaya (1963) in line with the concept postulated by Ramsey et al. defined adoption as ' the stage in the adoption process where decision making is complete regarding the use of a practice and action with regard to such a decision commences.'

From the point of view of this study, adoption is defined in terms of the overt behaviour of farmers in taking up all the required soil conservation works.

Adoption of all the required soil conservation works indicate:

a. adoption of any one of the Engineering measures like contour bunding,

b. the required Agronomy measures viz: crop rotation, strip cropping, contour tillage and mixed cropping and

c. the required Agrostology measures like planting grass on top of bunds.

Partial adoption.

Rogers (1961) defined partial adoption as the partial use of an innovation. Partial adoption from the point of view of this study is referred to the adoption of only one or a few practices which come under any one of the three main groups viz: Engineering, Agronomy and Agrostology measures for soil conservation, but not sufficient to protect the land from various types of erosion.

Non-adoption.

Non-adoption in the study refers to the non-practising of any of the recommended soil conservation measures for the area.

Independent variables.

a. Age

The importance of age of the farmer in the adoption of various improved practices needs no justification. In some studies, it was reported that age has a positive

relation with adoption. In some other studies, it was reported that age was negatively correlated with adoption.

Ryan and Gross (1950) reported that youthfulness was related to earliness of adoption of improved agricultural practices.

Coleman (1951) found that there was no consistent relationship between age and various indices of contact with extension.

Wilkening (1952), Anderson (1955) and Copp (1956) concluded that age of the operators was negatively associated with the attitude towards adoption of approved farm practices.

Lionberger (1960) stated that elderly farmers seem to be somewhat less inclined to adopt new farm practices than younger ones.

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

Rahim (1961), Rao (1961), Reddy (1962) and Bose and Saxena (1965) revealed that age had no relationship with adoption.

Bhasin (1966), Bhatia (1966), and Rao (1966) and Singh (1966) have stated that influence of age on adoption was not significant.

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

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

The study of Oliver, Annamalai and Parthasarathy (1975) revealed that young and middle aged farmers were less conservative in taking up cultivation of high yielding varieties.

In the circumstances, it was postulated that age would be negatively associated with adoption of soil conservation measures.

b. Education

Education is the process of producing the desired changes in the behaviour of the people. Formal education helps an individual to know the world better and he is prone to seek for information which will increase his knowledge. Beal and Sibley (1967) have pointed out that

the individual's ability to read and write and the amount of formal education he possesses will effect the manner in which the individual gathers data and relates himself to his environment. The literate and better educated farmers are prone to accept innovations in agriculture more than those who are less educated.

Potti (1960), Bose (1960), Rahudkar (1961), Rahudkar (1962), Reddy (1962), Bhakshy (1962), Das Gupta (1963) and Sinha and Yadav (1964) have concluded that education had positive relationship with adoption.

Jain (1965), Das Gupta (1966), Shetty (1966) and Verma (1966) did not support that education had positive influence on adoption.

Bhasin (1966), Bhatia (1966), Gupta (1966) Mahajan (1966), Rajagopalan and Singh (1967) stated that education had positive relation with adoption.

Roy and others (1968), Banda and Banda (1968) and Rao (1968) concluded in their studies that education had positive relationship with adoption.

Vyas et al.(1969), Sundaraswamy (1971), Oliver, Annamalai and Parthasarathy (1975), and Chandrasekharan and Subramoniam (1975) revealed in their studies that

education had positive relationship with adoption.

Hence, it was postulated that education would have a positive influence on adoption of soil conservation measures.

c. Income.

It is the money received during a given period as salary, receipts from trade, interest from investments etc.

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

Lionberger (1960), Sahay (1961), and Jaiswal and Singh (1968) in their studies concluded that income had positive influence on adoption.

Oliver, Dureiswamy and Radhakrishna Menon (1975) studied the socio-economic factors and adoption and revealed that income had significant influence on learning and adoption of practices.

Based on the above findings, it was postulated that income would have a positive influence on adoption of soil conservation measures.

d. Size of holding.

It is referred to the area of land owned by the farmer. One partial indicator of excellence in farming is farm size. Farm size has consistently been shown to be highly and positively related with adoption behaviour.

Sahay (1961) found that the relationship between adoption and farm size was curvilinear. He reported that adoption was highest in case of farmers having medium sized farm.

Rahudkar (1961), Bakshi (1962), Reddy (1962), Das Gupta (1963), Dhaliwal (1963), Dhara (1965), Jain (1965), Mulai and Ray (1965), Mahajan (1966), Gupta (1966), Rajagopalan and Singh (1967), Roy (1967), Choudhary (1967), Reddy and Kivlin (1968) Roy and Others (1968) and Chandrasekharan and Subramonian (1975) reported in their studies that farm size had positive relationship with adoption.

Based on the above studies, it was postulated that size of holding would have a positive influence on adoption.

e. Social participation.

Social participation refers to the association of any

individual with formal organizations. It's positive relationship with adoption has frequently been demonstrated. Association with formal organisations makes it possible for the farmer to get in contact with progressive farmers, extension workers and thereby increase his knowledge of new practices which will result in a high level of adoption of the practices.

Rahudkar (1961), Bose and Das Gupta (1962), Das Gupta (1963), Purohit (1963), Bose (1964), and Sinha and Yadav (1964) in their studies concluded that social participation had positive influence on adoption of practices.

Bose (1964), Das Gupta (1966), Gupta (1966), Bhatia (1966) and Roy and others (1968) did not support this view.

Vyas et al.(1969) and Sundaraswamy (1971) revealed that social participation had a positive influence on the adoption of farm practices.

Hence, it was postulated that a farmer's adoption behaviour would be positively related to the extent of his social participation.

f. Knowledge.

Knowledge is one of the important components of behaviour and as such plays an important part in the behaviour of an individual. Once knowledge is acquired, it produces changes in the thinking process of an individual and would lead to a higher adoption. Knowledge about the farming innovation is an indication of the degree to which a farmer is willing to adopt that innovation.

Koya (1962), Bose (1964) and Sinha and Yadav (1964) reported that knowledge of innovation had positive influence on adoption.

Rahim (1964) and Beal and Others (1967) did not support this statement.

Rai (1967), Singh (1968), Reddy and Kivlin (1968), Roy and Others (1968) and Parameswaran (1973) in their studies revealed that knowledge of innovations had positive relationship with adoption.

Hence, it was postulated that knowledge of recommended soil conservation measures would have a positive influence on adoption.

g. Attitude.

Allport (1935) has defined attitude as ' a mental and natural state of readiness organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related'. Murphy and New Comb (1937) defined attitude as ' primarily a way of being set toward or against certain things'.

Man possesses attitudes towards a wide range of phenomena. As Krech and Crutchfield (1962) have pointed out, it is the valence and the degree of multiplicity of attitude that decide the influence of attitude on behaviour at a given point of time.

Singh (1961), Narayanan (1965), Singh (1966), Thakur (1966), Singh (1968) and Sharma and Nair (1969) reported in their studies that attitude had a positive relationship with adoption of practices.

In the study, it was postulated that the greater the degree of attitude a farmer was having towards soil conservation, the greater would be the adoption of soil conservation practices.

h. Initial cost.

It refers to the initial investment on the required soil conservation works. It was expected that the extent of adoption of soil conservation measures would be more for those farmers who perceived that the soil conservation works were less costly.

Roy (1960), Singh (1961) and Rai (1967) concluded that initial cost was negatively related with adoption of practices.

The perceptive faculty of the farmer towards the initial cost was postulated as having direct relationship with adoption.

i. Simplicity.

Simplicity is the degree to which an innovation is easy to understand and adopt, whereas complexity refers to the degree to which an innovation is difficult to understand and use.

Roy and Jaiswal (1969) found that simplicity had positive influence on adoption of practices.

Chandrasekharan and Subramonian (1975) in a study revealed that farmers are more likely to adopt farm practices when they perceive the practice to be simple to adopt.

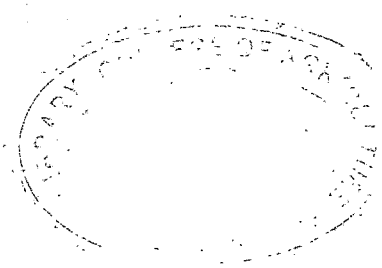
It was expected that the extent of adoption of soil conservation work would be more in the case of farmers who perceived the soil conservation works as simple to adopt.

j. Credit facilities.

More investment on land is required in order to complete the required soil conservation works. Such additional expenditure must be financed by loans or subsidy from Government or Private agencies. Production credit at reasonable rates of interest can be helpful in the adoption of soil conservation practices. The capital requirement for contour bunding is more and hence the credit need is also more. A farmer who perceives the importance of credit and who is willing to take credit may adopt the works earlier.

Singh (1961) and Singh (1967) in their studies revealed that credit facilities had positive influence on adoption.

This was not supported by Reddy and Kivlin (1968) whose conclusion was that there was no relationship between credit facilites and adoption.



In the circumstances, it was postulated that there would be a positive relationship between credit facilities and adoption of soil conservation measures.

k. Availability of materials.

Stones for the construction of contour bunds, seeds, seedlings and grass slips are required for implementing the soil conservation programme. If all the raw materials are available, the farmer may find it easy to adopt the recommended soil conservation measures.

Choudhary (1967), Rai (1967) and Jaiswal and Singh (1968) in their studies concluded that availability of materials had positive influence on adoption of practices.

Based on the above studies, it was postulated that availability of materials for soil conservation works would have positive relationship with adoption of soil conservation measures.

C. Review of studies on adoption of soil conservation measures.

Singh (1961) analysed the people's response to soil conservation practices in two Damodar Valley villages.

He reported that lack of communicability of soil conservation innovations, poverty of the farmers, small scattered fragmental holdings, prevalence of share cropping system, lack of suitable credit institutions, village factionalism, illiteracy and pessimistic outlook of farmers were the major factors associated with non-adoption of soil conservation practices.

Studies on impact of soil conservation programme in Kerala.

The State Planning Board (1968) has conducted a study in Kerala state to assess the impact of the soil conservation schemes on agricultural land in respect of the cropping pattern and the effect on contour bunding particularly in relation to productivity.

The important findings in their report were:-

1. There was a heavy shortfall in the achievements of physical and financial targets. Though the pace of implementation was accelerated since 1964-1965, the overall target of the III Plan could not be achieved.
2. The average expenditure per hectare of land treated under soil conservation measures in the selected schemes came to Rs.265/.

3. The important crops benefited were rubber, arecanut and coconut.

4. For every sum of Rs.2/- spent on conservation measures, the gross income rose by one Rupee per year.

5. About 40 per cent of the beneficiaries contacted reported that the bunds were broken in parts of their holdings.

6. Sixty three per cent of the cultivators contacted considered the cost of soil conservation measures moderate and reasonable.

The State Planning Board (1970) has conducted another evaluation study on soil conservation programme to study the impact and also to probe deeper into the cost-benefit relation. The findings were:-

1. There was significant increase in cultivation of perennial crops in soil conservation scheme areas.

2. No significant diversification of cropping patterns was effected nor any new crop introduced, which indicated lack of fallow up and absence of any attempt to popularise agronomic practices for the adoption of soil conservation measures.

3. The gross money income per hectare rose by 68 per cent in a four year period begining with 1965-1966 in the scheme area - the increase in gross real income was about 29 per cent.

4. The expenditure on soil conservation scheme was found to be not only protective but also productive.

The third evaluation study conducted by State Planning Board (1976) on soil conservation programme in hilly agricultural lands of Kerala to assess the actual benefits achieved in terms of physical and economic units, to assess the progress achieved in soil conservation works and to identify the constraints and difficulties in the successful implementation of the schemes revealed the following results:-

1. The average cost of contour bunding work per hectare worked out to Rs.626/-
2. The increase in yield as an effect of soil conservation work ranged from 31 to 187 per cent for coconut, 2 to 40 per cent for arecanut, 4 to 160 per cent for pepper and 1 to 412 per cent for tapioca.

3. Increase in income from the areas where soil conservation works were done ranged from 3 per cent in Kozhikode District to 1061 per cent in Kottayam District, the increase being more than 50 per cent in 6 out of 10 Districts.

4. The incremental income from the area of adoption of soil conservation work was worked out to an average of Rs.375.85 perhectare. Contour bunding was found to be economical.

5. Nearly 60 per cent of the sample beneficiaries considered maintenance of bunds a serious problem. Maintenance of bunds was not receiving proper attention in the scheme areas.

6. To introduce conservation farming practices, no serious extension efforts were made in the State.

7. Nearly 59 per cent of the reporting beneficiary cultivators considered the execution of contour bunding work for soil conservation as efficient, and the rest considered it to be moderately efficient. 64.4 per cent of the cultivators considered the cost of contour bunding as moderate, while 33.1 per cent thought it to be excessive. 95 per cent of the sample beneficiaries was satisfied with the techniques of contour bunding as suitable to the respective localities.

The above studies conducted by the State Planning Board gives an idea about the impact of soil conservation programme, problems in scheme areas and benefits of soil conservation work as perceived by farmers. But those studies do not specifically measure the influence of the variables related to adoption of soil conservation measures.

MATERIALS AND METHODS

CHAPTER III

MATERIALS AND METHODS

This chapter explains the following: A. basis for selection of variables, B. hypotheses, C. procedures used for the empirical measurement of the variables under study, D. location of the area of study, E.procedures followed for the selection of the samples for the study, F. procedures followed for collection of data and G. statistical procedures used in the analysis of data.

A. Basis for selection of variables

Adoption behaviour is a multivariate phenomenon. Adoption is a process involving the interaction of many factors, and hence more than one aspect of an individual's behaviour must be measured in order to explain the variation in adoption behaviour. There are many variables that affect adoption as shown in Table 2 given in the chapter of review of literature. Since it is a big task for a researcher to study all the variables that affect adoption, the specific variables for this study have been selected based on a pilot study. They are

1. Socio personal variables
   a. age
   b. education

c. income

d. size of holding

e. social participation

f. knowledge

g. attitude.

2. Stimulus variables

a. initial cost

b. simplicity

3. Situational variables

a. credit facilities

b. availability of materials

B. Derivation of hypotheses

The following hypotheses were formulated for this study.

1. age

There will be negative relationship between age of the farmers and adoption of soil conservation measures.

2. education

Education of farmers will be positively related to the adoption of soil conservation measures.

3. income

There will be positive relationship between income of farmers and adoption of soil conservation measures.

4. size of holding

Size of holding of farmers and adoption of soil conservation measures will be positively related.

5. Social participation

There will be positive relationship between social participation of farmers and adoption of soil conservation measures.

6. knowledge

There will be positive relationship between knowledge of farmers in soil conservation practices and adoption of soil conservation measures.

7. attitude

Attitude towards soil conservation and adoption of soil conservation measures will be positively related.

8. initial cost

There will be a negative relationship between the initial cost of soil conservation works and adoption of soil conservation measures.

9. simplicity

There will be a positive relationship between perception of simplicity of soil conservation works and adoption of soil conservation measures.

10. Credit facilities

Credit facilities and adoption of soil conservation measures will be positively related.

11. availability of materials

There will be a positive relationship between the availability of materials for soil conservation works and adoption of soil conservation measures.

C. Procedures used for the empirical measurement

Measurement of adoption

Several methods have been used to quantify the adoption behaviour by various research workers. Notable among those who utilised a scale for measuring adoption in some form or other are Wilkening (1952), Duncan and Kreetlow (1954), Marsh and Coleman (1955), Fliegel (1956), Copp (1956), Straus (1956), Emery and Ocser (1958), Linderstrom (1958), Ramsey and others (1959), Beal and Rogers (1960), Rahim (1961), Bose (1962), Chattopadhyaya (1963), Beal and Sibley (1967), Roy et al.(1968) and Supe (1969).

Wilkening (1952) used an index for measuring the adoption of improved farm practices. The index of adoption used was the percentage of practices adopted to the total number of practices applicable for that operator. Because of the differential nature of practices, he suggested differential weights in the adoption index.

Marsh and Coleman (1955) also used a practice adoption score computed on the percentage of applicable practices adopted.

Chattopadhaya (1963) has constructed an adoption quotiant to measure farm practice adoption. He has taken into consideration the different variables like potentiality, extent, weightage and time in developing the Adoption Quotient.

Adoption of soil conservation measures, the dependent variable in this study, was measured by the following formula.

$$\frac{e/p \times 100}{N}$$

where e = extent of area of adoption of the recommended practice.

p = total cultivable area of the respondent where soil conservation works are required

N = total number of practices to be adopted for soil conservation.

Accordingly, adoption score for each respondent in the groups of adopters and partial adopters in the completed project areas has been worked out.

Measurement of the reasons for non-adoption or partial adoption of soil conservation measures

To measure the different reasons for the non-adoption or partial adoption of soil conservation measures, the respondents were asked to respond to the reasons furnished under three different groups in a 5 point continuum. Reasons for non-adoption of Engineering measures, Agronomy measures and Agrostology measures were grouped separately. The reasons presented to the respondents were those collected after discussions with Officers of the Department of Agriculture (soil conservation unit) and few farmers in the scheme areas. In order to rank the reasons according to the degree of importance, a scoring technique as follows was used.

Response categories.	Most important.	Important.	Neither important nor unimportant.	Unimportant.	Most unimportant
Scores	4	3	2	1	0

The total score for each reason under each soil conservation practice was worked out separately for the three different groups of respondents. The rank of each reason was then found out and then the rank correlation coefficient was worked out for assessing the agreement between the groups.

1. Socio-personal variables

a. Age

In this study, age was measured in terms of number of completed years. The number of the farmer's completed year was taken as the index of his age.

b. Education

Education was measured in terms of the number of years of formal school and college studies undergone by the farmer.

c. Income

Income was measured in terms of the total money received by the farmer annually in Rupees.

d. Size of holding

In this study, farm size was measured in land units. The number of acres cultivated by an individual farmer was taken as the index of farm size.

e. Social participation

The important institutions available in the locality have been identified. The farmers were asked to indicate the institutions in which they had membership or in which they were office bearers. The extent of participation was measured by using the following scoring technique.

	Score
no membership in any organization	0
membership in any one organization	1
membership in more than one organization or office bearer of any organization	2

The score for social participation was obtained by summing up the scores for the three items for each respondent.

f. Knowledge

'Lindquist' (1951) had described the procedure for developing the scale for measuring knowledge. Measurement of knowledge is usually done by using this scale. For the purpose of this study, a simple test was developed as stated below.

The content of the test was composed of questions called items. Items for the test were collected in consultation with the Officers of the department of agriculture (soil conservation unit). While collecting items, care was taken to include relevant information of the three important aspects of soil conservation measures viz. Engineering, Agronomy and Agrostology measures. Those question[s] which had average difficulty index were selected. These twelve questions for items developed to measure the knowledge of farmers were grouped into three. The first group contains items on Engineering measures. The second group contains items on Agronomy measures. The third group contains items on Agrostology measures.

To measure the variable, these 12 items were presented to the 60 respondents which consist of adopters and partial adopters. These respondents were asked to state yes or no for each item. For the favourable answer, a score of 1 was given. For the unfavourable answer 0 was given. The total scores obtained by the respondent for the twelve items indicate the extent of knowledge of the respondent in soil conservation practices. The maximum

score that a respondent could obtain was 12 which means that he has full knowledge on soil conservation measures.

g. Attitude

Edwards (1957) has discussed the problem of assessing attitudes by direct questioning and by observation and concluded that both these methods result in a rather crude classification of attitudes. For a quick and reliable quantitative measure of attitude with large groups, the usefulness of attitude measurement scales has been amply demonstrated. Attitude scales afford to order the various stimuli, which possesses in varying but unknown degree the attribute in which we are interested, on a psychological continuum with respect to the degree of the attribute each possesses. 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.

Among the techniques available for construction of scales, two are very important and widely used:

They are the Thurstone technique and the Likert technique. In this study, the Likert method was used to develop a scale to measure the attitude of farmers towards soil conservation measures.

Likert method is one of the summated ratings. The basic assumption of the method of summated rating is that each statement in the scale covers the entire attitude continuum and that an individual's overall choice of degree of acceptance or rejection determines his position on the continuum. The general steps for constructing an attitude scale by Likert method are the following:

a. Collection of a large number of statements considered to be relevant to the attitude being measured.

b. Editing the statements to eliminate irrelevant and ambiguous items.

c. Administering a trial scale with selected items to a sample of individuals who have been sufficiently exposed to the object to form an attitude.

d. Calculation of critical ratio for each statement (critical ratio is a measure of the extent to which a given statement differentiates between a high and low group).

e. Final selection of items on the basis of the critical ratio.

f. Finding the reliability and validity of the scale.

The details of the steps followed to construct the Likert type scale to measure attitude towards soil conservation are described below:-

a. Collection of statements

The first step in evolving the scale was to collect a large number of statements from the universe of content. These statements with respect to soil conservation were collected from related studies and informal discussions with farmers and extension staff. From these sources, 50 items were selected.

b. Editing the statements.

The statements thus collected were edited as per the criteria suggested by Edwards (1957). From the 50 statements, 25 items were selected after eliminating ambiguous and irrelevant items.

c. Selection of the items.

The selection of items for the final scale was done by the critical ratio method as described by Edwards.

The 25 items chosen after editing were then presented to 100 farmers selected at random and who were different

from the sample of this study. Their responses for each statement on a five point continuum from ' strongly agree to strongly disagree' were obtained. The total scores assigned for the favourable statements were as follows: strongly agree = 4, agree = 3, undecided = 2, disagree =1 and strongly disagree = 0. For the unfavourable statements, the scoring system was reverted.

The subjects were then arranged in the descending order of total scores obtained by them. From this, twenty five per cent of the respondents with the highest total score and twenty five per cent with the lowest total score were selected to form the criterion groups to find out the critical ratio of the 25 statements, which is a measure of the extent to which a given statement differentiates between high and low groups. The critical ratio for each of the 25 statements was calculated by using the following formula.

$$\text{critical ratio} = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\Sigma(X_H - \bar{X}_H)^2 + \Sigma(X_L - \bar{X}_L)^2}{n\,(n-1)}}}$$

$$\text{where } \Sigma(X_H - \bar{X}_H)^2 = \Sigma X_H^2 - \frac{(\Sigma X_H)^2}{n}$$

$$\Sigma(X_L - \bar{X}_L)^2 = \Sigma X_L^2 - \frac{(\Sigma X_L)^2}{n}$$

$\bar{X}_H$ = Mean score on a given statement for the high group.

$\bar{X}_L$ = Mean score for the same statement for the low group.

n = Number of respondents in each group.

The edited 25 statements and their 't' values are given in Appendix I.

The statements with 't' value more than 4 were then selected for the final scale as given in Table 3. These ten statements include positive and negative statements. The scoring technique for the selected 10 statements was as follows:-

Positive statements:

Response categories	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Score	4	3	2	1	0

For negative statements, the scoring was reversed.

Table 3

Statements selected for the final scale to measure attitude with their 't' values

Sl. No.	Statements	't' value
1	It is desirable to preserve soil fertility by adopting soil conservation.	7.29
2	Reports on the advantages of soil conservation are only propaganda and should not believe it.	6.97
3	Soil con servation is a technique of Government to cheat farmers	6.81
4	Inadequate soil conservation measures deplete the soil of its fertility	6.80
5	One need not hestitate to adopt soil conservation	6.00
6	Soil conservation work should be adopted by all farmers	4.74
7	Soil conservation is the important aspect of Agriculture	4.57
8	Every progressive farmer should know about soil conservation measures	4.44
9	Soil conservation works destroy the crops in the land	4.13
10	If all farmers take up soil conservation the food problem can be solved by increase in production.	4.05

Reliability of the scale.

The concept of reliability is considered about the accuracy with which the score represents the status of an individual in whatever aspect the test measures him. A test score is called reliable when we have reason for believing the score to be stable and trustworthy. A scale is reliable only when it will consistently produce the same results when applied to the same sample. In this study, the reliability of the scale was found by test - re-test method.

Test - re-test method.

The scale was administered twice, to 25 respondents selected at random with an interval of 30 days. The score for each respondent was calculated and the correlation coefficients between the two sets of scores was calculated. The re-test correlation coefficient was 0.93 which indicated a high correlation at 0.05 level.

Validity for the scale.

The main criterion for content validity is how well the contents of the scale represent the subject matter under study. As all the possible items within the universe of

content were selected by discussion with specialists and farmers, the present scale has the content validity.

2. Stimulus variables

a. Initial cost

To measure this variable, three questions were presented to the respondents who were asked to locate the position in the continuum ranging from very costly to very cheap. The following scoring technique was used.

Response categories.	Very costly	Costly	Moderate	Cheap	Very cheap
Scores	0	1	2	3	4

The score for perception of initial cost was obtained by summing up the scores for the three questions for each respondent.

b. Simplicity.

To quantify simplicity, the respondents were asked three questions. The responses were obtained on a 5 point rating scale as follows.

Response categories.	Very complex	Complex	Moderate	Simple	Very simple
Scores	0	1	2	3	4

The point on the scale at the extreme right was the most favourable position and the point at the extreme left was the most unfavourable position relating to the adoption. The score for perception of simplicity was obtained by summing up the scores for the three questions for each respondent.

5. Situational variables.

a. Credit facilities

This variable was measured by questions on awareness of credit, need for credit and the difficulty in obtaining credit. The score of 1 was given to the favourable answer of each question. The score for unfavourable answer was 0. To find out the score for credit facilities, the total score was worked out for the three questions for each respondent.

b. Availability of materials

To quantify the perception of availability of materials, the respondents were asked to state as to whether

materials were available for adopting the particular practice. A score of 1 was given for the favourable answer and 0 for the unfavourable answer. The total scores were worked out for the two questions about the availability of materials for soil conservation works.

D. Location of the area of study.

The study was undertaken in Trivandrum District. A brief description of the District is given below:

Trivandrum District has a total geographic area of 218600* hectares. The total cropped area is 247329* hectares. Area sown more than once is 101656* hectares. The population according to 1971 census was 21.98* lakhs. The percentage of literacy (1971) was 62.54*.

The important crops grown in the District are coconut, tapioca, paddy etc. Tapioca is covering an area of 77053 hectares in the District. The crop is cultivated even on high slopes which permits soil erosion. The undulating topography and the wide practice of cultivation of tapioca along the slopes contribute to the soil erosion besides other factors.

* Source: Kerala Agricultural University, Mannuthy - Kerala in Agricultural Statistics 1977.

E. Selection of the sample areas

As the objective of the study was to study the adoption of soil conservation measures in scheme areas, otherwise called as project areas, it was necessary to compare it with the new project area where the execution of soil conservation works has not commenced. Hence a sample group from the completed project areas, another sample group from non-adopters from the completed project areas and a third sample group from the new project areas, where the execution of soil conservation works has not commenced, were selected.

Selection of project areas

Soil conservation works are taken up on watershed sub catchment basis. Such subcatchments where execution of soil conservation work is taken up as per the provisions of the Act are scheme areas or project areas. Execution of soil conservation works is taken up by the beneficiaries themselves. The details of projects where soil conservation works have been undertaken are given in Table 4. It can be seen from the table that the major variation of the different projects is in the size of the area involved. The size ranges from 50 acres to 2316 acres.

Table 4

Completed projects and new project areas in Trivandrum District

A. Projects having more than 500 acres of completed area.

Sl. No.	Name of project	Location (Village and Taluk)	Total area (workable) Area in acres	Area completed Area in acres	Date of completion
1.	Perumkadavila	Perumkadavila, Neyyattinkara Taluk	2316	819	15.11.70
2.	Vamanapuram	Nellanad Nedumangad Taluk	1606	962	21.2.1969
3.	Chemboor	Perumkadavila, Neyyattinkara Taluk	2302	995	15.7.1967
4.	Kottukal	Kottukal, Neyyattinkara Taluk.	1964	1875	1.3.1966
5.	Karakulam	Karakulam, Nedumangad Taluk.	1073	850	29.6.1963
6.	Aruvikkara	Vellanad and Karakulam Nedumangad Taluk.	1604	1165	29.6.1963

B. Projects having less than 500 acres of completed area

Sl. No.	Name of project	Location (Village and Taluk)	Total area (workable) Area in acres	Area completed Area in acres	Date of completion
1.	Mylachal	Perumkadavila, Neyyattinkara Taluk.	1412	269.5	4.5.1975
2.	Vilangumala	Ottasekharamangalam Neyyattinkara Taluk.	411	216	28.12.1974
3.	Poovachal	Veeranakavu Nedumangad Taluk.	809	137	14.2.1973.
4.	Puthuveettumuri Colony	Ottasekharamangalam Neyyattinkara Taluk.	164	163	20.7.1972.
5.	Nagaroor	Vellalloor, Chirayinkil Taluk.	708	15	19.11.1971.
6.	Manjappara	Pulimath Chirayinkil Taluk	87	83	31.3.1971
7.	Vazhichal	Ottasekharamangalam Neyyattinkara Taluk.	388	218	15.6.1970
8.	Vithura	Uzhamalakkal Nedumangad Taluk	620	93	26.2.1970.
9.	Keezhvalam	Keezhvalam Chirayinkil Taluk	1169	46	11.11.1969.
10.	Nalanchira	Ulloor, Trivandrum Taluk.	50	32	19.12.1969.
11.	Mudakkal	Mudakkal, Elamba Chirayinkil Taluk.	401	225	11.10.1968
12.	Varkala	Chemmaruthy, Chirayinkil Taluk	975	138	31.12.1965

C. New Projects where execution of soil conservation works have not commenced, but ready for execution.

Sl. No.	Name of new project	Location (Village and Taluk)	Total workable area (in acres)
1	Kanniakulangara	Vembayam, Vamanapuram Nedumangad.	800
2	Karippukalkunnu	do	640
3	Mangalapuram	Veiloor, Chirayinkil Taluk	300
4	Mampuzhakkara	Neyyattinkara Taluk	640
5	Mukkadil	Pullampara, Nedumangad Taluk	560
6	Mulamkadukunnu	Vembayam, Nedumangad Taluk	445
7	Nemom	Thiruvallam Trivandrum	3500
8	Pulimath	Kilimanoor, Chirayinkil Taluk	560
9	Punnathanam	Vilappil, Neyyattinkara Taluk.	388
10	Talikuzhi	Pulimath, Chirayinkil Taluk.	240
11	Theppukal	Vembayam, Nedumangad Taluk	608
12	Valikkodu	Neyyattinkara	403

In a bigger project area, because of the large size and more number of farmers involved, the interaction effect may be more which may lead to greater adoption. So, it was decided to select samples from one small sized and one large sized project areas. Hence the completed projects were stratified into two groups viz. Projects having less than 500 acres of completed area and projects having completed area of more than 500 acres. From these two groups, one project area each was selected on random basis.

Thus, the project area of Nagarcor which represents the small sized projects and the project area of Vamanapuram which represents the large sized projects were selected in Chirayinkil and Nedumanged Taluks respectively.

Selection of new project area

As explained earlier, in order to find out the rate of adoption of soil conservation measures in the completed project area, it was necessary to compare it with new project areas where work has not commenced. So an area from the list of new project areas as given in Table 4 was selected at random. Thus, the new project area of Mukkudil was selected.

Selection of respondents

The complete lists of the farmers in the Vamanapuram, Nagaroor and Mukkudil areas have been prepared from the details available in the District Soil Conservation Office, Trivandrum.

In each completed project area, there are adopters and partial adopters. So also, there are non-adopters in such area. So, from the two completed project areas selected, one list of respondents consisting of adopters and partial adopters was prepared. Another list of respondents consisting of non-adopters from the two completed project areas was also prepared.

The groups

A

From the list of adopters including partial adopters from Vamanapuram and Nagaroor project areas, proportionate sample size of 60 respondents was selected by random sampling. This group of adopters and partial adopters in the completed project areas is hereafter referred to as A group.

B

From the list of non-adopters of the Vamanapuram and Nagaroor projects, proportionate sample size of 60 respondents was selected by random sampling. This group of non-adopters in the completed schems areas is hereafter referred to as B group.

C

From the list of farmers in the Mukkudil new project area where soil conservation works have not yet commenced, 60 respondents were selected at random. This group of respondents from the area where no soil conservation work has been executed, but for which draft schemes have been prepared and kept ready for execution, is hereafter referred to as C group.

Details of distribution of samples in selected project areas are given in table 5.

Table 5

Selected project and new project areas and distribution of samples

Sl. No.	Name of project area selected for the study.	Total No.of farmers in the project area.	Total No.of farmers who have taken up contour bunding work.	No.of farmers who have not taken up contour bunding works.	Sample size from the group of adopters and partial adopters.	Sample size from the group of non-adopters.	Sample size from the population
1.	Vamanapuram (completed scheme)	2187	578	1609	58	32	..
2.	Nageroor (completed scheme)	1436	20	1416	2	28	..
3.	Mukkadil (New project area)	1135	Works not commenced		..	..	60

F. Procedures followed for collection of data.

Construction of interview schedule

A draft interview schedule was prepared which was administered to 20 farmers who were not in the main sample. In the light of the results of this pre-testing, suitable modifications

were made and the schedule was finalised. The schedule is given in Appendix II.

Methods of data collection

The data were collected by interviewing the farmers by the researcher. The respondents were interviewed individually. The schedule was administered in Malayalam.

6. Statistical procedures

The following statistical tests were used in the study.

1. Spearmen's rank correlation coefficient.

For the purpose of testing the agreement between two groups, the rank correlation coefficient was used. The rank correlation coefficient can be symbolised as follows:-

$$r = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$$

where r = rank correlation coefficient

d = difference between ranks

n = number of pairs of statements.

2. Test of significance - Large sample test

For testing the significance of the difference between 2 groups of equal size, the large sample test was used. The following test criterion was adopted.

$$\frac{|\bar{X}_1 - \bar{X}_2|}{\text{S.E}\,(\bar{X}_1 - \bar{X}_2)}$$

where S.E. of $(\bar{X}_1 - \bar{X}_2) = \sqrt{\left(\frac{S_1^2 + S_2^2}{n}\right)}$

$\bar{X}_1$ = mean of the first sample

$\bar{X}_2$ = mean of the second sample

S_1 = S.D. of the first sample

S_2 = S.D. of the second sample

3. Correlation coefficient

To determine the magnitude of the relationship between the independent variables with adoption, the correlation coefficient was worked out and tested for their significance using the students 't' test to test the significance of the sample correlation coefficient.

Similarly, inter-correlations between the independent variables were also computed and tested to know their significance.

RESULTS

CHAPTER IV

RESULTS

The results with relevant tables are given in this chapter under the following head lines:-

1 The extent of adoption of soil conservation measures in the scheme areas.

2 Effect of soil conservation programme as perceived by the farmers.

3 Reasons for partial adoption or non-adoption of the recommended practices of soil conservation.

4 Difference between respondents in groups A, B and C with respect to the studied variables.

5 Relationship of the independent variables with adoption behaviour of farmers.

6 Inter-relationship between the selected independent variables.

1. Extent of adoption of soil conservation measures in the scheme areas.

The data on the extent of adoption are given in Table 6. The table reveals that out of 60 respondents, only 20 were full adopters. They have adopted all the three items of

soil conservation works viz. Engineering, Agronomy and Agrostology measures. The number of respondents who have adopted Engineering and Agronomy works only was 8. A total number of 32 respondents in the A group adopted only Engineering measures.

Result showed that only 33.3 per cent of the farmers in A group were full adopters and the remaining 66.7 per cent were partial adopters.

Table 6

Extent of adoption of soil conservation practices in A group.

Name of practice	Number of adopters	Percentage
Engineering works only	32	53.33
Agronomy works only	..	..
Agrostology works only	..	..
Engineering and Agronomy works	8	13.33
Engineering and Agrostology works	..	..
Agronomy and Agrostology works	..	..
Engineering, Agronomy and Agrostology works.	20	33.33

2. Effect of soil conservation programme as perceived by the farmers.

a. Effect on yield.

Table 7 gives the magnitude of increase in yield as perceived by the adopters and partial adopters. 95 per cent of the farmers in group A perceived that there was increase in yield in tapioca and coconut after 5 years of completion of soil conservation work.

The mean increase in yield as perceived by farmers for tapioca and coconut was 25.25 per cent and 29.21 per cent respectively.

Table 7

Effect of soil conservation programme on yield as perceived by adopters and partial adopters.

Crop	Perception of magnitude of increase in yield in percentage					Mean increase in yield in percentage
	0-10%	10-20%	20-30%	30-40%	40-50%	
Percentage of farmers who perceived increase in yield, in tapioca.	8.33	35.00	38.33	13.33	5.00	25.25
do coconut	6.67	13.33	41.67	20.00	18.33	29.21

b. Effect on control of silting.

Table 8 gives the number of farmers in group A who perceived that the soil conservation works were effective in controlling silting of paddy fields. 93.33 per cent perceived that soil conservation works resulted in the controlling of silting in paddy fields.

Table 8

Effect of soil conservation programme on controlling silting of paddy fields as perceived by farmers.

Response	Number of farmers	Percentage
Control silting	56	93.33
No effect	4	6.67
Total	60	100

c. Effect on conservation of moisture.

All the 60 farmers in group A perceived that the soil conservation measures have effect on conserving soil moisture.

3. Reasons for partial adoption or non-adoption of recommended practices of soil conservation.

a. Engineering measures.

The reasons with their scores and ranks for non-adoption of Engineering measures in the groups B and C are given in Table 9.

Table 9

Reasons for non-adoption of Engineering measures

Sl. No.	Reasons	Group B		Group C	
		Score	Rank	Score	Rank
1.	High initial cost of the technique	118	3	114	3
2.	Only long term profit and no immediate increase in returns	9	9	4	7
3.	Lack of credit facilities for taking up the work	187	1	219	1
4.	Lack of knowledge about the different Engineering measures.	15	6	0	6
5.	Inadequate technical assistance for the work.	55	5	150	2
6.	Non-availability of stones in the locality for construction of Engineering works	155	2	56	4
7.	Difficulty in getting skilled labourers in the locality	14	7	0	8.5
8.	Complexity of the Engineering works.	62	4	55	5
9.	Problems in periodical maintenance of the bunds.	13	8	0	8.5

b. Agronomy measures.

The reasons for non-adoption of Agronomy measures in the groups A, B and C are given in Table 10, duly ranked along with total score for each reason.

Table 10

Reasons for non-adoption of Agronomy measures

Sl. No.	Reasons	Group A N = 32		Group B N = 60		Group C N = 60	
		Score	Rank	Score	Rank	Score	Rank
1.	Lack of knowledge about the Agronomic measures for soil conservation.	114	2	122	4	76	3
2.	Lack of technical guidance.	115	1	140	3	202	1
3.	Inadequate financial assistance for taking up Agronomy measures.	95	3	174	1	196	2
4.	Poor fertility status for growing different crops.	0	6	3	6	0	6
5.	Want of irrigation facilities for growing certain crops.	52	5	24	5	4	5
6.	Non-availability of materials for planting, manuring etc.	78	4	172	2	72	4

c. Agrostology measures

The reasons for non-adoption of Agrostology measures in the groups A, B and C are given in Table 11 duly ranked, with details of scores for each reason.

Table 11

Reasons for non-adoption of Agrostology measures

Sl. No.	Reasons	Group A N = 40		Group B N = 60		Group C N = 60	
		Score	Rank	Score	Rank	Score	Rank
1.	Inadequate technical guidance.	143	1	159	1	200	1
2.	Inadequate financial assistance for taking up the works.	40	4	115	3	145	2
3.	Difficulties in irrigating the grass till they establish.	44	3	13	4	0	4
4.	Non-availability of grass slips and other planting materials.	101	2	151	2	55	3

Agreement in the perception of the degree of importance of the stated reasons for the non-adoption of soil conservation measures.

a. Non-adoption of Engineering measures.

The rank correlation coefficient between group B and

group C was 0.83 which was significant at 0.05 level as given in Table 12. So, there was agreement between the two groups.

b. Non-adoption of Agronomy measures.

The rank correlation coefficient between group A and B was 0.54 which was not significant at 0.05 level indicating disagreement between these groups.

The rank correlation coefficients between groups A and C and groups B and C were 0.94 and 0.95 respectively which showed significance at 0.05 level as given in Table 12. So, there was agreement between the groups A and C and groups B and C.

c. Non-adoption of Agrostology measures.

As given in Table 12, the rank correlation coefficients between groups A and B, groups A and C and groups B and C were 0.8, 0.4 and 0.8 respectively which indicated that they were not significant at 0.05 level. Hence, there was no agreement between these groups.

Table 12

Rank correlation between groups with respect to the stated reasons for the non-adoption of soil conservation measures.

Soil conservation measures	Groups	Rank correlation coefficient
1. Reasons for the non-adoption of Engineering measures.	B vs C	0.83*
2. Reasons for the non-adoption of Agronomy measures.	A vs B	0.54
	A vs C	0.94*
	B vs C	0.95*
3. Reasons for the non-adoption of Agrostology measures.	A vs B	0.80
	A vs C	0.40
	B vs C	0.80

* Significant at 0.05 level.

4. Difference between respondents in groups A, B and C with respect to the studied variables.

The difference between the groups were tested by using the test of significance used in large samples. With a sample size of 60 eachin groups A, B and C, the difference of each variable between groups was tested. The results of the tests of significance are given in Table 13. The mean values of the variables of all groups are presented in Fig.1.

Table 13

Mean, standard deviation, values of normal deviates and significance with respect to the studied variables of groups A, B and C.

Sl. No.	Name of variable	Group A		Group B		Group C		Values of normal deviate		Significance
		Mean	SD	Mean	SD	Mean	SD			
1	2	3	4	5	6	7	8	9		10
1	Age	50.85	4.44	60.32	7.28	51.67	5.89	A vs B	73.90	S
								A vs C	0.67	N.S.
								B vs C	51.17	S
2	Education	7.70	2.03	4.38	2.37	4.38	2.44	A vs B	68.75	S
								A vs C	65.59	S
								B vs C	0.00	N.S.
3	Income	1422.50	669.47	759.17	460.93	800.85	593.96	A vs B	39.96	S
								A vs C	28.94	S
								B vs C	0.003	N.S
4	Size of holding	1.43	1.23	0.68	0.70	0.78	0.76	A vs B	16.91	S
								A vs C	24.58	S
								B vs C	0.208	N.S
5	Social participation	1.13	0.61	0.30	1.66	0.17	0.37	A vs B	13.33	S
								A vs C	116.80	S
								B vs C	0.354	N.S.
6	Knowledge	9.62	1.77	6.77	1.73	7.18	1.61	A vs B	79.62	S
								A vs C	62.30	S
								B vs C	1.86	N.S.

(Table 13 contd.)

1	2	3	4	5	6	7	8	9	10
7	Attitude	33.65	4.44	26.15	3.27	27.93	2.41	A vs B A vs C B vs C	110.72 S 76.62 S 11.52 S
8	Initial cost	7.02	2.64	4.20	2.12	4.83	1.56	A vs B A vs C B vs C	55.06 S 43.71 S 3.47 N.S
9	Simplicity	6.58	1.89	4.53	1.68	5.47	1.65	A vs B A vs C B vs C	39.64 S 11.87 S 9.45 S
10	Credit facilities	2.87	0.54	2.07	0.36	1.98	0.22	A vs B A vs C B vs C	160.00 S 389.50 S 3.00 N.S.
11	Availability of materials.	1.32	0.49	0.33	0.59	1.42	0.86	A vs B A vs C B vs C	96.60 S 0.62 N.S. 65.11 S

Fig.1

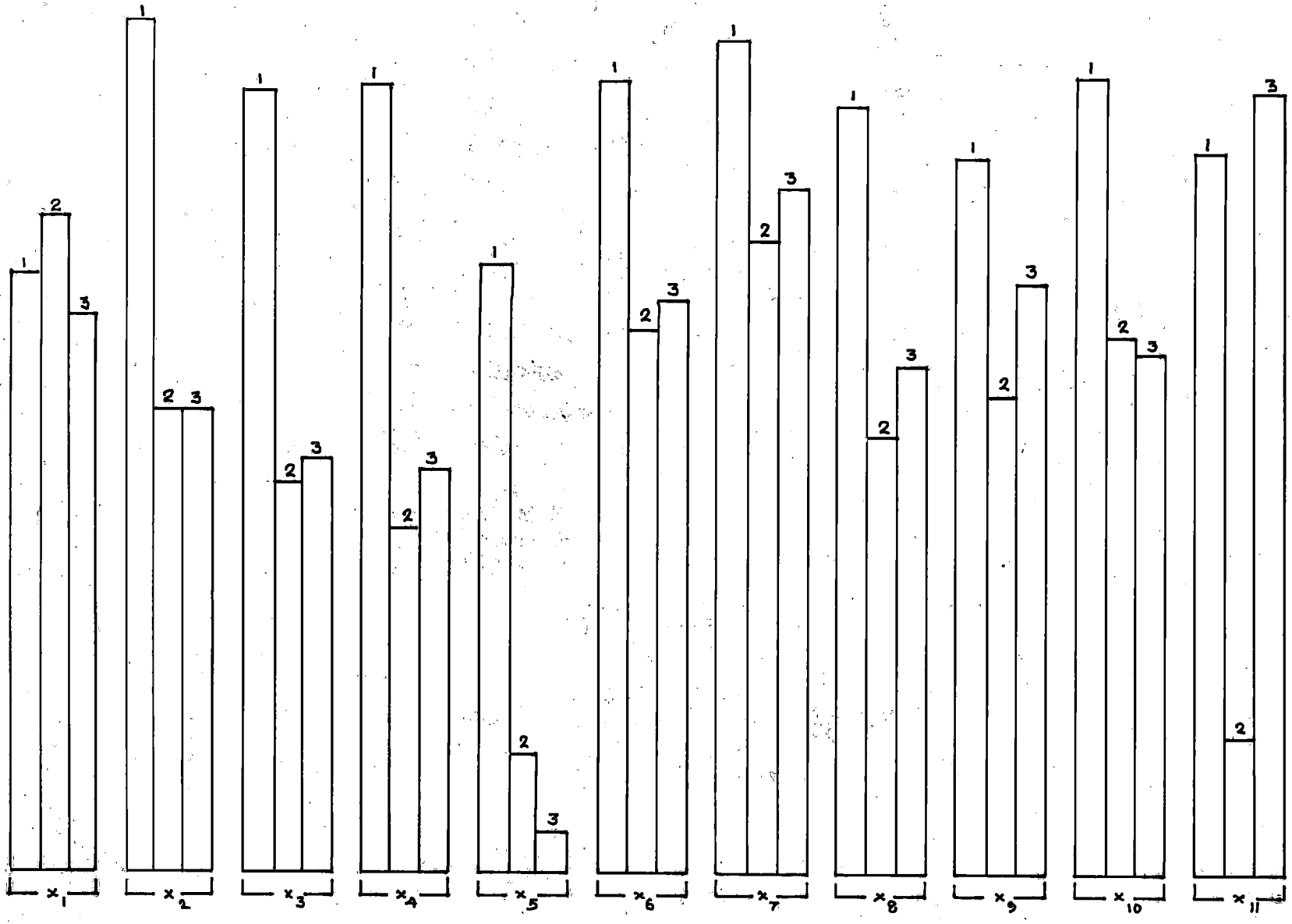
Mean values of the variables of the three groups

L E G E N D

1 group A
2 group B
3 group C.

x_1 age
x_2 education
x_3 income
x_4 size of holding
x_5 social participation
x_6 knowledge
x_7 attitude
x_8 initial cost
x_9 simplicity
x_{10} credit facilities
x_{11} availability of materials

FIG: 1 - MEAN VALUES OF THE VARIABLES OF THE THREE GROUPS



a. Age.

With respect to this variable, the values of normal deviate of the tests between groups A vs B and group B vs C were significant at 0.05 level. The test value between groups A vs C was not significant. So, it indicated significant differences in age between groups A vs B and groups B vs C. The test also indicated that there was no significant difference between groups A vs C.

b. Education.

The values were significant between groups A vs B and A vs C at 0.05 level. B vs C was not significant. This indicated difference in education between groups A vs B and groups A vs C. There was no significant difference between groups B vs C.

c. Income.

The test values were significant between groups A vs B and groups A vs C at 0.05 level. B vs C was not significant. So, there was significant difference in income between groups A vs B and groups A vs C. There was no significant difference between groups B vs C.

d. Size of holding.

The values were significant between groups A vs B and groupsA vs C at 0.05 level. B vs C was not significant. So, the test indicated a significant difference in the size of holding between groups A vs B and groups A vs C. There was no significant difference between groups B vs C.

e. Social participation.

The values of normal deviates between groups A vs B and groups A vs C were significant at 0.05 level. B vs C was not significant. It indicated a significant difference in social participation between groups A vs B and groups A vs C. There was no significant difference between groups B vs C.

f. Knowledge.

The values between groups A vs B and groups A vs C were significant at 0.05 level. B vs C was not significant. So, it could be inferred that there was a difference in knowledge between groups A vs B and groups A vs C. There was no significant difference between groups B vs C.

g. Attitude.

The values between groups A vs B, A vs C and B vs C were significant at 0.05 level, indicating significant

difference in attitude between groups A vs B, A vs C and B vs C.

h. Initial cost.

The values of normal deviates obtained in the test of significance between groups A vs B and A vs C were significant at 0.05 level. B vs C was not significant. This indicated a significant difference in the perception of initial cost between groups A vs B, A vs C and no significant difference between groups B vs C.

i. Simplicity.

The values between groups A vs B, A vs C and B vs C were significant at 0.05 level. This indicated a significant difference in the perception of simplicity between groups A vs B, A vs C and B vs C.

j. Credit facilities.

The test values between groups A vs B and A vs C were significant at 0.05 level. B vs C was not significant. This indicated a significant difference in the credit facilities with respect to between groups A vs B and A vs C. There was no difference between groups B and C with regard to this variable.

k. Availability of materials.

The values of normal deviates between groups A vs B and B vs C were found to be significant at 0.05 level. A vs C was not significant. Hence there was significant difference in the availability of materials between groups A vs B and B vs C. There was no significant difference in the availability of materials between groups A vs C.

5. Relationship of the independent variables with adoption behaviour of farmers.

To study the relationship of the independent variables with adoption of soil conservation measures, the correlation coefficients were worked out between each variable and adoption. The variables and their correlation coefficients are given in Table 14.

Table 14

Correlation coefficient between the variables and adoption.

Sl. No.	Name of variable	Correlation coefficient
1	Age	- 0.78*
2	Education	0.80*
3	Income	0.71*
4	Size of holding	0.35*
5	Social participation	0.31*
6	Knowledge	0.85*
7	Attitude	0.77*
8	Initial cost	- 0.02
9	Simplicity	0.60*
10	Credit facilities	- 0.03
11	Availabilityof materials	0.54*

* Significant at P = 0.05 level

a. Age

The hypothesis in null form is: There is positive relationship between age and adoption. The null hypothesis was refuted.

The r value obtained was -0.78 which was significant at 0.05 level. It indicated negative correlation with adoption of soil conservation measures.

b. Education.

The hypothesis in null form is: there is no significant relationship between education and adoption. The null hypothesis was refuted. The r value was 0.80 which was significant at 0.05 level. It indicated high positive correlation with adoption of soil conservation measures.

c. Income.

The hypothesis in null form is: there is no significant relationship between income and adoption. The null hypothesis was refuted. The r value was 0.71 which was significant at 0.05 level. This indicated positive correlation with adoption of soil conservation measures.

d. Size of holding.

The hypothesis in null form is: there is no significant relationship between size of holding and adoption. The null hypothesis was refuted. The r value computed was 0.35 which was significant at 0.05 level. So it

could be inferred that size of holding had positive relation with adoption of soil conservation measures.

e. Social participation.

The hypothesis in null form is: there is no significant relationship between social participation and adoption. The null hypothesis was refuted. The r value obtained was 0.31 which was significant at 0.05 level. It indicated positive relationship with adoption of soil conservation measures.

f. Knowledge.

The hypothesis in null form is: there is no significant relationship between knowledge and adoption. The null hypothesis was refuted. The r value found out was 0.65 which was significant at 0.05 level. So it could be inferred that there was high positive relationship of this variable with adoption of soil conservation measures.

g. Attitude.

The hypothesis in null form is: there is no significant relationship between attitude and adoption. The null hypothesis was refuted. The r value obtained was 0.77

which was significant at 0.05 level. So, this variable had positive relation with adoption of soil conservation measures.

h. Initial cost.

The hypothesis in null form is: there is no significant relationship between initial cost and adoption. The null hypothesis was accepted. The r value was found to be -0.02 which was not significant at 0.05 level. So there existed no significant relation between initial cost and adoption of soil conservation measures.

i. Simplicity.

The hypothesis in null form is: there is no significant relationship between perception of simplicity and adoption of soil conservation works. The null hypothesis was refuted. The r value was found to be 0.60 which was significant at 0.05 level. It indicated positive correlation with adoption of soil conservation measures.

j. Credit facilities.

The hypothesis in null form is: there is no significant relationship between credit facilities and adoption.

The null hypothesis was accepted. The r value was -0.03 which was not significant at 0.05 level. So, there was no significant relation between credit facilities and adoption of soil conservation measures.

k. Availability of materials.

The hypothesis in null form is: there is no significant relationship between availability of materials and adoption. The null hypothesis was refuted. The r value was 0.54 which was significant at 0.05 level. So, this variable had positive correlation with adoption of soil conservation measures.

6. Inter-relationship between the selected independent variables in the A group of study.

To study the relationship in between the independent variables under study, inter correlation between the relevant variables have been computed with respect to the group A and tested for significance at 0.05 level. The correlation matrix is given in Table 15 and explained below:

Table 15

Correlation matrix of independent variables under study

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
X_1	..	-0.67*	-0.58*	-0.11	-0.16	-0.69*	-0.63*	0.07	-0.41*	0.06	-0.34*
X_2	..	..	0.58*	0.20	-0.45*	0.70*	0.75*	0.06	0.59*	-0.08	0.42*
X_3	..	..	..	0.65*	0.24	0.57*	0.62*	0.04	0.51*	-0.32*	0.42*
X_4	..	..	..	..	0.28*	0.28*	0.35*	0.01	0.15	-0.46*	0.12
X_5	..	..	..	..	..	0.27*	0.37*	-0.05	0.26*	0.01	0.08
X_6	..	..	..	..	..	..	0.74*	-0.06	0.51*	-0.01	0.57*
X_7	..	..	..	..	..	..	..	-0.19	0.45*	-0.21	0.44*
X_8	..	..	..	..	..	..	..	..	0.26*	0.12	-0.12
X_9	..	..	..	..	..	..	..	..	..	-0.01	0.54*
X_{10}	..	..	..	..	..	..	..	..	..	..	-0.04
X_{11}	..	..	..	..	..	..	..	..	..	..	..

* Significant at 0.05 level

X_1 = age
X_2 = education
X_3 = income
X_4 = size of holding
X_5 = Social participation
X_6 = Knowledge.
X_7 = Attitude
X_8 = Initial cost
X_9 = Simplicity
X_{10} = credit facilities
X_{11} = Availability of materials.

a. Age and its relation with other variables.

The correlation coefficients computed and tested for significance showed that age was negatively correlated with education, income, knowledge, attitude, perception of simplicity and perception of availability of materials. It was also found that age had no significant relationship with size of holdings, social participation, perception of initial cost and credit facilities.

b. Education and its relation with other variables.

The significance of the correlation coefficients indicated that education was negatively correlated with social participation and age, but positively correlated with income, knowledge, attitude, perception of simplicity and availability of materials. Education had no significant relationship with the size of holding, initial cost and credit facilities.

c. Income and other variables.

The correlation matrix showed that income had negative correlation with credit facilities and age, but positive correlation with size of holdings, knowledge, attitude, perception of simplicity, availability of

materials and education. Income had no significant relationship with social participation and perception of initial cost.

d. Size of holding and other variables.

The tests of significance of the r value computed showed that size of holding had negative correlation with credit facilities, but positive correlation with social participation, knowledge, attitude and income. Size of holding had no significant relationship with initial cost, perception of simplicity and perception of availability of materials.

e. Social participation and other variables.

Social participation was found to be positively correlated with knowledge, attitude, simplicity and size of holding. But social participation was not found having any significant relationship with perception of initial cost, credit facilities and perception of availability of materials. Education was negatively correlated with social participation.

f. Knowledge and other variables.

Knowledge was found to be positively correlated with attitude, perception of simplicity, availability of materials, social participation, size of holding, income and education. But knowledge had no significant relationship with perception of initial cost and credit facilities. Age was negatively correlated with knowledge.

g. Attitude and other variables.

Attitude was found to be having positive correlation with perception of simplicity, availability of materials, education, income, size of holding, social participation and knowledge. But attitude had no significant relationship with initial cost and credit facilities. Age was negatively correlated with attitude.

i. Initial cost and other variables.

It was found that initial cost had positive correlation with simplicity and no significant relationship with other variables.

j. Simplicity and other variables.

It was found that simplicity had positive correlation with perception of availability of materials, attitude,

knowledge, social participation, income, education, and perception of initial cost. Age was negatively correlated with perception of simplicity, but no significant relationship was found with credit facilities.

K. Credit facilities and other variables.

The variable was found to be having negative relationship with income and size of holding, but no significant relationship with other variables.

DISCUSSION

CHAPTER V

DISCUSSION

The present chapter is devoted to discussion of the results obtained from the study. The main objectives of the study were to study the extent of adoption of soil conservation programme, reasons for the partial adoption and non-adoption of the recommended soil conservation measures and to study the relationship between adoption of recommended soil conservation practices and socio-personal characters of farmers. Hence, discussion is mainly confined to these aspects of investigation.

A. Extent of adoption of recommended soil conservation measures

The results revealed that only 33.33 per cent of the farmers in group A were adopters of all the required soil conservation practices. 66.66 per cent of the farmers in group A were partial adopters out of which 53.33 per cent adopted only Engineering works and the remaining 13.33 per cent adopted Engineering as well as Agronomy measures.

It is seen that majority of farmers in completed scheme areas constituted partial adopters. The study in group A where the Department has executed the soil

conservation work indicated that the follow up of Engineering practice by Agronomy and Agrostology practices was poor. Out of 60 respondents in group A, only 20 farmers adopted Engineering, Agronomy and Agrostology measures.

Hence it is evident that there is a clear need for taking up more seriously the essential task of follow up of the Engineering measures with Agronomy and Agrostology measures. This view of the Researcher is in confirmity with the findings recorded by the State Planning Board (1970), evaluation study on soil conservation programme.

B. Effect of soil conservation Programme as perceived by the farmers

The benefits from soil conservation measures assume variegated forms and not all of them are quantifiable. The loss of top soil and the depletion of soil fertility constitute a grave menace. Erosion in any plot of land, if unchecked, often leads to erosion in neighbouring plots in course of time and this sort of vicarious effect also does not lend itself to measurement. Effective soil conservation measures enhance soil capacity, creating congenial conditions for optimum land use. Abundant

opportunities for increasing the return from land emerge from this process, but these again are not easily measurable.

Among the numerous benefits flowing from the soil conservation programme, three categories were picked up for special consideration and studied in group A.

1. Effect on yield

The most important crops in the area are tapioca and coconut. Hence increase in yield of these two crops as a result of soil conservation work as perceived by farmers was studied.

95 per cent of the farmers perceived that there was increase in yield in tapioca and coconut. The mean increase in yield as perceived by farmers for tapioca and coconut after 5 years of completion of soil conservation work were 23.25 per cent and 29.21 per cent respectively.

The State Planning Board (1976) revealed in their evaluation study that the increase in yield as an effect of soil conservation programme ranged from 31 to 187 per cent for coconut and 1 to 412 per cent for tapioca. This

variation in increase in yield might be due to the reason that the State Planning Board's finding was the result of study conducted on different Districts of Kerala and not pertaining to Trivandrum District only.

2. Effect on control of silting

93.33 per cent of the respondents perceived that soil conservation works resulted in controlling of silting of paddy fields. Hence, it showed that majority of the farmers were convinced about this benefit.

3. Effect on conservation of moisture

100 per cent of the respondents perceived that the soil conservation works were beneficial for conserving soil moisture.

C. Reasons for non-adoption or partial adoption of recommended soil conservation measures

The purpose of the analysis of the reasons for non-adoption was to study the problems in implementing soil conservation programmes as experienced by farmers.

1. Non-adoption of Engineering measures

In the group A, all respondents have adopted Engineering measures required.

The reasons for non-adoption of Engineering measures in group B were the following according to their order of importance.

a. Lack of credit facilities for taking up the work.
b. Non-availability of stones in the locality for construction of Engineering works.
c. High initial cost of the technique.
d. Complexity of the Engineering works.
e. Inadequate technical assistance for the work.
f. Lack of knowledge about the different Engineering measures.
g. Difficulty in getting skilled labourers in the locality.
h. Problems in periodical maintenance of the bunds.
i. Only long term profit and no immediate returns.

The reasons for non-adoption of Engineering measures in group C, where the Department has not commenced execution works, were the following according to their order of importance.

a. Lack of credit facilities for taking up the work.
b. Inadequate technical assistance for the work.
c. High initial cost of the technique.
d. Non-availability of stones in the locality for construction of Engineering works.

e. Complexity of the Engineering works.

f. Lack of knowledge about the different Engineering measures.

g. Only long term profit and no immediate increase in returns.

h. Difficulty in getting skilled labourers in the locality.

i. Problems in periodical maintenance of bunds.

The test of significance of the rank correlation coefficient indicated that there was agreement in the perception of the degree of importance of the stated reasons between respondents in group B and C.

2. Non-adoption of Agronomy measures.

The reasons for the non-adoption of Agronomy measures in group A according to their order of importance were: lack of technical guidance, lack of knowledge about the Agronomy measures for soil conservation, inadequate financial assistance for taking up Agronomy measures, non-availability of materials for planting, manuring etc., want of irrigation facilities for growing certain crops and poor fertility status for growing different crops.

The reasons for the non-adoption of Agronomy measures in group B according to their order of importance

were: inadequate financial assistance for taking up Agronomy measures, non-availability of materials for planting, manuring etc., lack of technical guidance, lack of knowledge about the Agronomy measures for soil conservation, want of irrigation facilities for growing certain crops and poor fertility status for growing different crops.

The reasons for the non-adoption of Agronomy measures in group C according to their order of importance were: lack of technical guidance, inadequate financial assistance for taking up Agronomy measures, lack of knowledge about the Agronomy measures for soil conservation, non-availability of materials for planting, manuring etc., want of irrigation facilities for growing certain crops and poor fertility status for growing different crops.

The test of significance of the rank correlation coefficients indicated that there was no agreement between groups A vs B. There was agreement between groups A vs C and B vs C.

3. Non-adoption of Agrostology measures

The reasons for the non-adoption of Agrostology measures in group A according to their order of importance

were:inadequate technical guidance, non-availability of grass slips and other planting materials, difficulties in irrigating grass till they establish and inadequate financial assistance for taking up the work.

The reasons for the non-adoption of Agrostology measures in group B according to their order of importance were: inadequate technical guidance, non-availability of grass slips and other planting materials, inadequate financial assistance for taking up the works and difficulties in irrigating the grass till they establish.

The reasons for the non-adoption of Agrostology measures in group C according to their order of importance were: inadequate technical assistance, inadequate financial assistance for taking up the works, non-availability of grass slips and other planting materials and difficulties in irrigating grass till they establish.

The test of significance of the rank correlation coefficients indicated that there was no agreement between groups A vs B, A vs C and B vs C.

In the light of the above findings, the problems in implementing soil conservation measures as perceived by

the farmers have become clear. The problems of periodical maintenance of the bunds and want of serious extension efforts to educate the farmers on Agronomy and Agrostology measures were reported by the State Planning Board (1960). If all the above problems are well thought of and attended to in time by the Department and extension workers, the schemes can be implemented in a more effective way.

D. Difference between groups A, B and C with respect to the studied variables

In the case of the two variables: age and availability of materials, no significant difference was found between groups A vs C. But significant difference was found in the case of these two variables between groups A vs B and B vs C.

With regard to the seven variables: education, income, size of holding, social participation, knowledge, initial ocost and credit facilities, no significant difference was found between groups B vs C. But significant difference was found in the case of these seven variables between groups A vs B and A vs C.

With respect to the two other variables: attitude and simplicity, there was significant difference between all the three groups.

It was revealed from the results, that the groups A vs B differed significantly with respect to all the eleven variables selected for the study. Difference was observed between groups A vs C with respect to the nine variables namely: education, income, size of holding, social participation, knowledge, attitude, perception of initial cost, perception of simplicity and credit facilities. It was also revealed that there was difference between groups B vs C with respect to the four variables namely: age, attitude, perception of simplicity and availability of materials.

E. Relationship of the independent variables with adoption behaviour of farmers

The correlation coefficients of the variables with adoption and their significance at 0.05 level with regard to the respondents of group A were given in Table 14 of Chapter IV.

The following variables were found to have positive and significant relationship with adoption of soil conservation measures.

1. Education
2. Income
3. Size of holding
4. Social participation
5. Knowledge
6. Attitude
7. Simplicity
8. Availability of materials.

Age was found to have negative and significant relationship with adoption of soil conservation measures.

Perception of initial cost and credit facilities were found to be having no significant relationship with adoption of soil conservation measures.

1. Age.

The data supported the proposition that there was negative relationship. This is in conformity with the findings of Wilkening (1952) and Copp (1956).

There are certain opposite theories too. Rao (1961), Reddy (1962) and Mahajan (1966) postulated that age was not having any relationship with adoption of improved agricultural practices.

The correlation matrix in Table 15 of chapter IV revealed that 6 variables namely: education, income, knowledge, attitude, perception of simplicity and availability of materials had negative correlation with age.

It can be concluded that the direct and indirect effects of younger age might have contributed to the significant relationship with adoption. Farmers of younger age might have got more opportunities for education, resulting in increased knowledge and income which ultimately might have helped to develop a favourable attitude towards adoption of soil conservation work. Hence, youthfulness was related to earlier adoption of soil conservation practices.

2. Education

The data supported the proposition that there was positive and significant relationship between education and adoption.

Many of the previous studies on adoption indicated that education was significantly and positively associated with adoption. Bose (1965), Gupta (1968) and Vyas et al. (1969) have also reported that there was

positive and significant relation between education level of farmers and adoption of high yielding varieties.

This is not in confirmity with the findings of Shetty (1966) and Singh and Pardasani (1967) whose studies did not reveal any significant relationship between education and adoption of improved practices.

The inter correlation between education and other variables showed that education was positively and significantly related with income, knowledge, attitude, perception of simplicity and availability of materials, but negatively correlated with social participation and age.

Education naturally might have raised the level of farmers' knowledge, attitude, income etc. which made the adoption easier. So, it can be concluded that direct and indirect effects of education might have contributed to the positive and significant relationship with adoption.

3. Income.

The data supported the proposition that there was positive and significant relationship between income and adoption.

This is in confirmity with the findings of Sundaraswamy (1971), Duraiswamy and Radhakrishna Menon (1975) and Raju (1975).

The intercorrelation between income and other variables showed that income was positively correlated with size of holding, knowledge, attitude, perception of simplicity, availability of materials and education. Income was negatively correlated with credit facilities and age.

Income might have raised the education level, knowledge, perception of simplicity etc. of the farmers, so that they took a positive attitude to adoption of the required soil conservation practices. So, it can be concluded that direct and indirect effects of income of the farmers might have contributed to the positive and significant relationship with adoption.

4. Size of holding

The data supported the proposition that there was positive and significant relationship between size of holding and adoption.

This is in confirmity with the findings of many research workers. Studies by Desai and Patel (1967), programme Evaluation Organization (1968 a, b and c

and 1969 a, b c), Kivlin (1968) and Chandrasekharan and Subramoniam (1975) have pointed out that larger holdings were positively and significantly related with adoption of improved practices.

Contrary to this, Singh (1967), Roy and others (1968) and Nanda and Nanda (1968) concluded that size of holding was not related with adoption of improved practices.

Size of holding was positively and significantly intercorrelated with social participation, knowledge, attitude and income as revealed from the data. It was negatively correlated with credit facility.

The findings indicated that farmers with big holdings were having comparatively more financial resources and high levels of knowledge, social participation and attitude so that they followed the recommended practices. The direct and indirect effects of size of holdings might have contributed to the positive and significant relationship with adoption.

5. Social participation.

Data showed that there was positive and significant relationship between social participation and adoption.

This is in confirmity with the findings of Singh (1967), Gupta (1967 and 1968) and Vyas et al.(1969) who also reveeled that social participation was related to the adoption of improved practices.

There are some opposite theories also. Dasgupta (1966) and Roy and others (1968) revealed that social participation had no significant influence on adoption of improved practices.

Social participation was positively correlated with knowledge, attitude, simplicity, size of holding, and negatively correlated with education as seen from the data in the study.

Membership in formal organisations might have helped the farmers to come in contact with different agencies and information sources and hence were likely to be more progressive and respective to new ideas and practices. The direct and indirect effects of social participation might have contributed to the positive and significant relationship with adoption.

6. Knowledge.

Data showed that there was positive and significant relationship between knowledge and adoption.

The finding indicated that knowledge of a practice was a pre-requisite for its adoption. Singh (1968), Rao (1968) and Parameswaran (1973) found that knowledge was positively and significantly related with adoption of improved practices.

Rahim (1964) and Beal and others (1967) did not support this view.

From the data, it was found that knowledge was positively correlated with attitude, perception of simplicity, availability of materials, social participation, size of holding, income and education. Knowledge and age were negatively correlated.

Knowledge of innovation seemed to be a must for adopting various improved practices. Knowledge of the practice might have helped the farmers in developing a more favourable attitude in adoption. The direct and indirect effects of knowledge might have contributed to the positive and significant relationship with adoption.

7. Attitude

Data showed that there was positive and significant relationship between attitude and adoption.

The finding is in confirmity with that of Thakur (1966), Singh (1968) and Sharma and Nair (1969) with respect to the adoption of improved practices.

From the data, it was found that attitude was positively correlated with some other variables namely: perception of simplicity, availability of materials, size of holding, income, education, social participation and knowledge. Attitude was negatively correlated with age.

Favourable attitude to a practice or idea might have influenced the farmers to acquire more knowledge on the practice and avail the required facilities. The direct and indirect effects of attitude might have contributed to the positive and significant relationship with adoption.

8. Perception of initial cost

Data did not show any significant relationship between perception of initial cost and adoption.

But, this is not in confirmity with the findings of Roy (1960), Singh (1961) and Rai (1967). They postulated that initial cost was negatively correlated with adoption

of practices. It was found that initial cost was positively correlated with simplicity and no significant relationship with other variables, as revealed from the study. This might be due to the reason that the Department paid the full cost of the contour bunding works as and when completed by way of 75 per cent loan and 25 per cent grant.

9. Simplicity.

The perception of simplicity was found to have a significant relationship with adoption in the study. This is in confirmity with the findings of Mulay and Roy (1965) and Singh (1969). Chandrasekharan and Subramanian (1975) in a study revealed that farmers were more likely to adopt farm practices when they perceived the practice to be simple to adopt. Simplicity, in the study, was correlated with some other variables namely; availability of materials, perception of initial cost, attitude, knowledge, social participation income and education. It was negatively correlated with age.

Adoption level of farmers, who perceived that soil conservation works were not difficult, was high.

Perception of simplicity might have helped the farmers in developing a more favourable attitude towards soil conservation work.

10. Credit facilities.

Data did not show any significant relationship between credit facilities and adoption.

This is in confirmity with the findings of Reddy and Kivlin (1968) who concluded that there was no relationship between credit facilities and adoption of practices.

Singh (1961) and Singh (1967) had a different view. They revealed that credit facility was having positive influence on adoption of practices. The variable was found to be having negative relationship with income and size of holding, but no significant relationship with other variables.

A farmer who perceives the importance of credit and who is willing to take credit may adopt the practices in the usual course. But in the scheme areas where soil conservation works were implemented with the direct assistance of the Department, the problems of perception of the importance of credit and willingness to take credit might not be of much importance. This might be due to the

reason that the Departmental staff were making prompt payments for the construction works from their offices near scheme areas. Farmers who were not willing to take credit might also have been pursuaded by Departmental staff to avail assistance and take up the work for the speedy implementation of the programme. The impact of the method of financial assistance from the Department might have contributed to the absence of any significant relation between credit facilities and adoption of soil conservation measures.

11. Availability of materials.

Data showed that there was positive and significant relationship between availability of materials and adoption.

This is in confirmity with the findings of Choudhary (1967), Rai (1967) and Jaiswal and Singh (1968) who concluded that availability of materials was having positive influence on adoption of practices.

From the data, it was also found that availability of materials was positively correlated with other variables namely: Perception of simplicity, attitude,

knowledge, income and education. It was negatively correlated with age.

For executing soil conservation works, stones, planting materials etc. are required. It would be more easy and profitable to take up the works if the raw materials required are easily available. Knowledge and attitude may help in locating the materials required. The perception of availability of materials for the work might have created a favourable attitude for soil conservation. So, the direct and indirect effects of the variable might have contributed to the positive and significant relationship with adoption.

SUMMARY

CHAPTER VI

SUMMARY

The magnitude of the problem of soil erosion is so high in Kerala mainly due to the undulating topography and high intensity of rainfall. More than 10 lakhs hectares of undulating land have to be protected from the hazards of erosion by effective soil conservation measures. The results of studies conducted on the soil loss by the soil conservation station, Konni has shown that the soil loss where slope was 30 per cent was 241.56 tonnes per acre per year. Attempts are made to control the serious loss of top soil by the Department of Agriculture (Soil Conservation Unit) by implementing integrated soil conservation schemes. But the progress of coverage was poor. Even in scheme areas, many farmers are non-adopters of the required soil conservation works. Many farmers have not taken up the required Agronomy and Agrostology works eventhough they completed the contour bunding works. A detailed study was essential to understand all those aspects of adoption. This study was an effort in that direction.

The specific objectives of the study were the following:-

1. To study the extent of adoption of recommended soil conservation measures.
2. To study the reasons for non-adoption or partial adoption of recommended soil conservation measures.
3. To study the relationship between adoption of recommended soil conservation practices and socio-personal characters of farmers.

The specific variables for the study were selected based on a pilot study. They were: age, education, income, size of holding, social participation, knowledge, attitude, initial cost, simplicity, credit facilities and availability of materials.

Age was measured in terms of number of completed years. Education was measured in terms of the number of years of formal school and college studies undergone by the farmer. Income was measured in terms of the total money received by the farmer annually in Rupees. Size of holding was measured in land units.

The extent of social participation was measured by using an appropriate scoring technique.

Measurement of knowledge was done by using a simple test. The content of the test was composed of questions

called items. Items for the test were collected in consultation with technical officers. While collecting items, care was taken to include relevant information of Engineering, Agronomy and Agrostology measures of soil conservation. The twelve questions developed to measure the knowledge of farmers were grouped into three. The respondents were asked to state yes or no for each item. For the favourable answer, a score of 1 and for the unfavourable answer a score of 0 were given. The total scores obtained by the respondent for the 12 items indicated the extent of knowledge of the respondent in soil conservation practices.

To measure attitude, the Likert method was used and 10 statements having the maximum t values were selected. Reliability of the scale was found by test-re-test method.

To measure the reasons for the non-adoption of soil conservation measures, three groups of reasons collected from technical officers were presented to the respondents. A 5-point scale was used to measure the degree of importance of the reasons stated by the respondents.

Suitable scoring techniques were evolved to measure the other variables selected for the study.

The study was undertaken in Trivandrum District. For the study, a sample from the completed project areas (Group A), another sample from the non-adopters from the completed project areas (Group B) and a third sample from the new project areas where the execution of soil conservation works has not commenced (Group C) were selected. Each sample group consisted of 60 respondents each.

The selection of scheme areas from the lists and selection of respondents from the lists of land owners of scheme areas were done by random sampling.

For collection of data from the 3 groups of respondents, the interview schedule developed for the purpose and pre-tested was used. The respondents were interviewed individually. The schedule was administered in Malayalam.

The statistical procedures used in the study were: spearman's rank correlation coefficient, test of significance (large sample test) and correlation coefficient.

Results and conclusions

A. Extent of adoption of soil conservation measures.

The study in group A indicated that the extent of adoption of Agronomy and Agrostology measures was poor.

33.3 per cent of the farmers were adopters of all the required practices. 66.7 per cent were partial adopters, out of which only 13.3 per cent adopted Engineering as well as Agronomy measures.

So, it is evident that there is a clear need for taking up more seriously the essential task of follow up of Engineering measures with Agronomy and Agrostology measures.

B. Effects of soil conservation programme.

95 per cent of the respondents perceived that there was increase in yield in tapioca and coconut. The mean increase in yield was 25.25 per cent and 29.21 per cent for tapioca and coconut respectively.

93 per cent of the respondents perceived that soil conservation works resulted in controlling of silting of paddy fields. 100 per cent of the respondents perceived that soil conservation works were beneficial for conserving moisture.

C. Reasons for non-adoption or partial adoption of recommended soil conservation measures.

The analysis of the reasons for non-adoption or partial adoption of the required soil conservation

measures as perceived by the farmers indicated the problems facing the implementation of soil conservation programme.

The most important reasons for the non-adoption of Engineering measures were the following:-

1. lack of credit facilities for taking up the work.
2. non-availability of stones in the locality for construction of Engineering works.
3. high initial cost of the technique.
4. inadequate technical assistance for the work.

The most important reasons for the non-adoption of Agronomy measures were the following:-

1. lack of technical guidance
2. inadequate financial assistance for taking up Agronomy measures.
3. lack of knowledge about the Agronomy measures for soil conservation.
4. non-availability of materials for planting, manuring etc.

The most important reasons for the non-adoption of Agrostology measures were the following:-

1. inadequate technical assistance
2. non-availability of grass slips and other planting materials.
3. inadequate financial assistance for taking up the works.

If all the above problems of farmers are attended in time, more speedy execution of the integrated soil conservation programmes can be anticipated.

D. Relationship between adoption of recommended soil conservation practices and socio-personal characters of farmers.

To study the factors influencing adoption, relationship of the selected 11 variables with adoption was measured.

Age was found to have negative and significant relationship with adoption of soil conservation measures. Education, income, size of holding, social participation, knowledge, attitude, simplicity and availability of materials were found to have positive and significant relationship with adoption of soil conservation measures.

Perception of initial cost and credit facilities were found to be having no significant relationship with adoption of soil conservation measures.

It can be concluded that the direct and indirect effects of the independent variables namely: age, education, income, size of holding, social participation, knowledge, attitude, simplicity and availability of materials might have contributed to their influence on adoption of soil conservation measures.

The study throws light on the extent of adoption of recommended soil conservation measures, reasons for non-adoption or partial adoption of the recommended soil conservation measures and the factors influencing adoption. The findings may help the soil conservation workers in formulating more effective soil conservation schemes. The knowledge about the socio-personal factors influencing adoption may help the extension workers to approach the farmers in the correct perspective for achieving the objectives.

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* Original not seen.

APPENDICES

APPENDIX I

Edited statements and their 't' values

Sl.No.	Statement	't' value
1	Soil conservation is the important aspect of Agriculture.	4.57
2	Inadequate soil conservation measures deplete the soil of its fertility.	6.80
3	It is desirable to preserve soil fertility by adopting soil conservation.	7.29
4	Food problem can be solved only by Scientific soil conservation practices.	3.89
5	Soil conservation increases crop production.	3.17
6	Every progressive farmer should know about soil conservation measures.	4.44
7	Soil conservation is a sheer waste of money.	3.14
8	Soil conservation is expensive work and not profitable	3.71
9	Soil conservation is a technique of Government to cheat farmers.	6.81
10	Soil conservation works destroy the crops in the land	4.13

APPENDIX I (Contd.)

Sl.No.	Statement	't' value
11	Soil conservation is not a scientific technique.	2.92
12	Soil conservation measures is complex for the farmer to follow.	1.99
13	Soil conservation technique has created a new outlook in Agriculture.	2.33
14	It is very difficult to adopt soil conservation practices.	0.99
15	Soil conservation requires more labour and hence not suited to our conditions.	0.85
16	It is worthy to spend more money for soil conservation.	2.50
17	Only rich farmers can take up soil conservation work.	0.17
18	Our soils are not suitable for taking up soil conservation works.	2.04
19	One need not hesitate to adopt soil conservation.	6.00
20	All types of farmers will be equally benefitted by adopting soil conservation practices.	2.02

APPENDIX I(Contd.)

Sl.No.	Statement	't' value
21	Reports on the advantage of soil conservation are only propaganda and should not believe it.	6.97
22	To invest more money on soil conservation is not wise.	1.85
23	Benefits from soil conservation work compensate the trouble in taking up the practice.	2.81
24	Soil conservation work should be adopted by all the farmers.	4.74
25	If all farmers take up soil conservation, the food problem can be solved by increase in production.	4.05

APPENDIX II

" A STUDY ON ADOPTION OF SOIL CONSERVATION MEASURES BY FARMERS IN SCHEME AREAS OF TRIVANDRUM DISTRICT"

INTERVIEW SCHEDULE

Serial No..... Date .....

Name of Scheme area

Whether new project area/covered area/area not covered

1. Name and address of the respondent:
2. Age (completed years):
3. Educational background (studied upto):
4. Income (Annual): Rs.
5. Caste:
6. Size of holding: Acre Cent
7. Social participation as member/Office bearer

   Name of Institutions/ agencies

   a. Co-operative Society

   b. Panchayat

   c. Farmers' Association

9. Knowledge test

Please give your response for the following questions about the practices recommended for soil conservation.

a. Engineering measures:-

1. Contour bunds are made across the slope — Yes/No
2. Top areas of the field should be first covered by contour bunding — Yes/No
3. Height of the contour bund is usually 2 metres — Yes/No
4. Construction of stone pitched bunds is not economic when compared to terracing — Yes/No

b. Agronomy measures:-

1. Ploughing across the slope is good for soil conservation — Yes/No
2. Growing erosion permitting crops and erosion resisting crops alternately in strips across the slope prevents soil erosion. — Yes/No
3. Tapioca cultivation on furrows or maunds along with slope prevents run off. — Yes/No
4. Growing crops mixed in the farm is unfavourable for soil conservation. — Yes/No

c. Agrostology measures:-

1. Growing grass or Pineapple along the top of bunds is useful for soil conservation. Yes/No

2. In steep slopes, planting grass or shrubs prevents run off Yes/No

3. Guinea grass is not a soil binding grass Yes/No

4. A good vegetative cover will not prevent run off. Yes No

9. Attitude towards soil conservation

Here are 10 statements which may reflect your opinion about soil conservation. Please indicate your response by making (✓) against each statement in the appropriate position.

Sl. No.	Statement	strongly agree	Agree	Undecided	Disagree.	Strongly disagree
1	2	3	4	5	6	7
1.	It is desirable to preserve soil fertility by adopting soil conservation.					

1	2	3	4	5	6	7

2. Reports on the advantages of soil conservation are only propeganda and should not believe it.

3. Soil conservation is a technique of government to cheat the farmers.

4. Inadequate soil conservation measures deplete the soil of its fertility.

5. One need not hesitate to adopt soil conservation.

6. Soil conservation work should be adopted by all farmers.

7. Soil conservation is the important aspect of agriculture.

8. Every progressive farmer should know about soil conservation measures.

9. Soil conservation works destroy the crops in the land.

1	2	3	4	5	6	7
10	If all farmers take up soil conservation, the food problem can be solved by increase in food production.					

10. Initial Cost

Very costly	Costly	Moderate	Cheap	Very cheap

1. Do you think the initial cost of Engineering works for soil conservation is high.
2. Do you think that the Agronomy measures are costly.
3. Do you think that the Agrostology measures are costly.

11. Simplicity

	Very complex	Com-plex	Mode-rate	Sim-ple	Very sim-ple
1. Do you think that the Engineering works for soil conservation are easy to adopt.					
2. Do you think that the Agronomy works for soil conservation are easy to adopt.					
3. Do you think that the Agrostology works for soil conservation are easy to adopt.					

12. Credit facilities

1. Are/Were you aware that the institutions provide credit for soil conservation work. Yes/No

2. Do/did you require credit from the institutions for soil conservation work. Yes/No

13. Perception of availability of materials.

1. Do you think that materials are/were available in the locality for construction of bunds/Engineering works. Yes/No

2. Are/were the planting materials available in the locality or made easily available from other sources. Yes/No

14. Extent of Adoption.

1. Total cultivable area Acre Cents

2. Total Area covered by different soil conservation measures.

Engineering measures	Agronomy measures	Agrostology measures
Acre Cent	Acre Cent	Acre Cent
Area covered by	Area covered by	Area covered by
a. Contour bunding.	a. Crop rotation.	a. Planting grass on bunds.
b. Contour trenching	b. Strip cropping	b. Other items
c. Terracing	c. Contour tillage	

3. Area not covered by any type of soil conservation work. Acre.... Cent...

15. 1. Do the soil conservation works require maintenance works. Yes/No

2. If yes, do you maintain the bunds regularly Yes/No

16. Effects of soil conservation:

1. Is there any increase in yield after completing soil conservation works. Yes/No

2. If yes, what difference:

Average yield/ acre before the completion of soil conservation work.	Average yield/ acre after 5 years of completion of soil conservation work.
In the case of	
a. Tapioca	
b. Coconut.	

3. Do you think that the soil conservation works done control silting of the paddy fields. Yes/No

4. Do you think that the soil conservation works help to conserve more moisture in the soil. Yes/No

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Reasons for non-adoption or partial adoption of soil conservation practices.

Reasons	Most important.	Important.	Neither important nor unimportant.	Unimportant.	Most unimportant
1	2	3	4	5	6
I. Engineering measures					
1. High initial cost of the technique.					
2. Only long term profit and no immediate increase in returns.					
3. Lack of credit facilities for taking up the work.					

1	2	3	4	5	6
4. Lack of knowledge about the different Engineering measures.					
5. Inadequate technical assistance for the work.					
6. Non-availability of stones in the locality for construction of Engineering works.					
7. Difficulty in getting skilled labourers in the locality.					
8. Complexity of the Engineering work.					
9. Problems in periodical maintenance of the bunds and terraces.					
10. Potential danger involved due to breaching of bunds.					
11. Very steep slope of land.					
12. Absence of owner instation.					
13. Low land value when compared to the high cost of the Engineering works required per acre of land.					

14. Poor depth of soil to permit terracing.

II. Agronomy measures.

1. Lack of knowledge about the Agronomic measures for soil conservation.
2. Lack of technical guidance.
3. Inadequate financial assistance for taking up Agronomy measures.
4. Poor fertility status for growing different crops.
5. Want of irrigation facilities for growing certain crops.
6. Non-availability of materials for planting, manuring etc.

III. Agrostology measures.

1. Inadequate technical guidance
2. Inadequate financial assistance for taking up the works.
3. Difficulties in irrigating the grass till they establish.
4. Non-availability of grass slips and other planting materials.
5. Limited availability of land for providing area for Agrostology measures.

ABSTRACT

The study on adoption of soil conservation measures by farmers in scheme areas of Trivandrum District was conducted under the auspices of the Kerala Agricultural University during 1977-1978.

Samples of 60 farmers each were drawn at random from three groups viz: (a) full adopters and partial adopters in scheme areas, (b) non-adopters in scheme areas and (c) farmers of new project areas where soil conservation works have not commenced. For the collection of data, the interview schedule developed and pre-tested was used.

The study revealed that only 35.3 per cent of the farmers were adopters of all the required practices in the first group. 66.7 per cent were only partial adopters.

The mean increase in yield as perceived by farmers was 23.25 per cent and 29.21 per cent for tapioca and coconut respectively.

The important reasons for the non-adoption of Engineering measures were: lack of credit facilities, non-availability of stones in the locality, high initial cost of the technique and inadequate technical assistance.

Lack of technical guidance, inadequate financial assistance, lack of knowledge and non-availability of

materials were the important reasons for the non-adoption of Agronomy measures.

Inadequate technical assistance, non-availability of planting materials and inadequate financial assistance were the important reasons for the non-adoption of Agrostology measures.

The results revealed that there was significant difference between adopters, and non-adopters with respect to age, education, income, size of holding, social participation, knowledge, attitude, initial cost, simplicity, credit facilities and availability of materials.

The study of the factors influencing adoption revealed that age was negatively and significantly related with adoption, whereas, education, income, size of holding, social participation, knowledge, attitude, simplicity and availability of materials were found to be positively and significantly related with adoption. Perception of initial cost and credit facilities were found to have no significant relationship with adoption.

The inter correlation among the different independent variables revealed that adoption was also a result of the interaction of the different independent variables.