ADOPTION OF
IMPROVED AGRICULTURAL PRACTICES
BY PEPPER GROWERS OF
IDUKKI DISTRICT

BY

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THESIS

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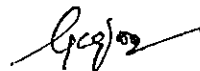
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D E C L A R A T I O N

I hereby declare that this thesis entitled "ADOPTION OF IMPROVED AGRICULTURAL PRACTICES BY PEPPER GROWERS OF IDUKKI 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.

GANGADHARAN , K.K.

Vellayani,

29,June 1993.

CERTIFICATE

Certified that this thesis entitled "ADOPTION OF IMPROVED AGRICULTURAL PRACTICES BY PEPPER GROWERS OF IDUKKI DISTRICT" is a record of research work done independently by Sri.GANGADHARAN,K.K. under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to him.

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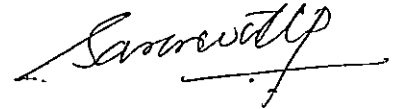
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GANGADHARAN, K.K.

C O N T E N T S

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INTRODUCTION

CHAPTER I

INTRODUCTION

Kerala is known to be the Spice Garden of India. Pepper is the most important item among spices which brings in to the country a substantial amount of foreign exchange amounting to nearly 240 crores a year which is 80.5 per cent of export earnings from all spices. Though, India accounts for 54 per cent of the world area under pepper, her share in production is only 26.6 per cent. The average productivity during the last five years works out to be 286 kg/hectare which is the lowest in the world when compared to other pepper producing countries like Malaysia and Brazil, where the black pepper yield ranges from 2,000 kg to 5,000 kg/ha/year.

In India, Kerala ranks first in area and production of pepper. More than 95 per cent of the production of pepper is contributed by Kerala. As per the published data of the Directorate of Economics and Statistics for 1989-90, pepper is cultivated in 1,67,000 hectares in Kerala with an annual production of 54,130 tonnes of black pepper. The pepper contributes 2.43 per cent of the state's agricultural income. Pepper is cultivated in home garden along with other crops and as mono crop in the two districts, namely, Wayanad and Idukki. There has been a

steep rise in area under black pepper (1.04 lakh ha to 1.67 lakh ha)especially during the last one decade, whereas, the trend in production of pepper in India has been steadily declining till 1988-89 and a spurt in production seen only in 1989-90.

Idukki is the major pepper growing area in Kerala which accounts for 39,107 hectares (23.40 per cent)and production 18,947 tonnes (34.99 per cent) as shown in table 1.1. In Idukki pepper is cultivated as mono crop. Many of the pepper growers are small and marginal farmers who solely depend on the crop for their livelihood. Diseases continue to be the main production constraint in Idukki district. Lack of high yielding varieties and non availability of quality planting materials are other important bottlenecks in increasing the production and prodductivity . The other reasons attributed to low production are the senility of vines, long duration rainless period, pest like pullu, top shoot borer etc.

Table 1.1. Area, production and productivity of pepper in Kerala (1989-90)[*]

Name of District	Area(Ha)	Production (tonnes)	Productivity (kg/ha)
Thiruvananthapuram	4418	1188	268.90
Kollam	8198	3589	437.79
Pathanamthitta	5578	2154	386.16
Alappuzha	2848	695	244.03

Name of District	Area(Ha)	Production (tonnes)	Productivity (kg/ha)
Kottayam	10210	1724	168.85
Idukki	39107	18947	484.49
Ernakulam	7251	1108	152.81
Thrissoor	5472	857	156.62
Palkkad	2448	311	127.04
Malappuram	6355	889	139.88
Kozhikode	15778	2510	159.08
Wayanad	23141	9148	395.36
Kannur	28389	8638	304.27
Kasargode	7811	2377	304.31
Total	167104	54135	324

* Source - Directorate of Economics and Statistics,Government of Kerala.

1.1 Need for the study

Though, India is a leading producer of black pepper in the world, the productivity of the crop is considerably low when compared to other major pepper producing countries. The cultivation system followed even today is largely traditional. Appropriate technologies have been developed in research stations which can increase the production considerably. For attaining sustainable yield of pepper, timely execution of the recommended package is essential. With a view to increase the production and productivity of

pepper, the various extension agencies have implemented several programmes which can change the attitude of pepper growers towards improved agricultural practices, thereby enhancing the rate of adoption of the improved agricultural practices in pepper.

No systematic study has been made so far to investigate the extent of adoption of improved agricultural practices in pepper. Hence, the present study entitled "adoption of improved agricultural practices by pepper growers of Idukki district" was taken up with the objective in view.

1.2 Objectives

The following were the specific objectives of the study.

1. To study the extent of awareness of improved agricultural practices in pepper by pepper growers.

2. To study the extent of knowledge of improved agricultural practices in pepper by pepper growers.

3. To study the attitude of pepper growers towards improved agricultural practices in pepper.

4. To study the extent of adoption of improved agricultural practices in pepper.

5.   To study the relationship between selected socio-psychological and economic characerestics of pepper growers with their awarness, knowledge, attitude and adoption of improved agricultural practices in pepper.

6.   To study the constraints in the adoption of improved agricultural practices in pepper and solutions to overcome the constraints.

1.3 Scope and limitations of the study

The adoption of recommended technology by farmers depend upon whether it is profitable in the production activity,whether the technology is readily available and farmers can bear the cost involved, whether farmers are market oriented for wider adoption and whether the recommendations are location specific. A study of this type will help to know how far the different innovations are accepted and adopted in pepper cultivation by the pepper growers.

Since pepper growers are distributed over the entire state, considering the limited time and other resources available at the disposal of the investigator, it was rather impossible to cover all the districts of Kerala to get an

overall picture. So, Idukki district which has the maximum area under pepper cultivation was taken for the present study. However, since a major pepper growing tract has been covered in the study, it is hoped that the generalization made in the study would have application to other pepper growing districts in Kerala.

1.4 Organization of the thesis

The report of the study has been spread under the Chapters given below.

The first Chapter dealt with the introduction wherein the need, objectives, scope and limitations of the study were discussed. The second Chapter covers the review of past work relating to the present study and locate the problems on a theoritical perspective. In the third Chapter,the methodology used in the research work including the operationalization of the concepts are given. The results are presented in the fourth Chapter. The findings of the study are discussed in the fifth Chapter and Chapter six gives a summary of the study followed by references and appendices.

THEORETICAL ORIENTATION

CHAPTER II

THEORETICAL ORIENTATION

The objective of this chapter is to link whatever research findings and other observations exist in the area of study with the research problem. For this, a review of literature has been made to integrate important findings which give proper orientation for the proposed research . This chapter explains the theoretical perspective adopted for the study. The results of the review are presented under the following main heads:

1.   Dependent variables selected. for the study.

2.   Independent variables and their relationship with dependent variables.

3.   Constraints experienced by pepper growers.

4.   Theoretical concepts and operational definitions.

5.   Conceptual framework for the study.

6.   Hypotheses framed for the study.

2.1 Dependent variables

2.1.1 Awareness

According to Dictionary of Behavioural Sciences, awareness is being concious of something, perceiving and taking account of some event, occasion, experience or object.

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

2.1.2 Knowledge

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

Ramsey et al(1959) suggested that cognitive adoption (covert) includes obtaining knowledge and critical evaluation of the practice in terms of the individual situation. The educational activities tend to increase the knowledge of the participants in these activities. Singh and Singh(1970) revealed that knowledge of package of practices was significantly contributing in explaining the adoption behaviour of the farmers.

Rogers and Shoemaker(1971) opined that knowledge of innovations could create motivation for their adoption.

Sethy et al(1984) reported that knowledge of technology is basic to adoption of high yielding rice technology for all categories of farmers.

2.1.3 Attitude

Allport (1935) defined attitude as a mental and neural state of readiness organised through experience exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related. Thurstone (1946) defined attitude as the degree of positive or negative affect associated with some psychological object towards which people can differ in varying degrees.

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

2.1.4 Adoption

The word 'adopt' has the meaning 'to take up and practise as one's own, to accept formally and put into effect'. Adoption of a particular message or production recommendation by a farmer implies the voluntary acceptance of the message and its practise.

Wilkening (1953) postulated the adoption of an innovation as a process composed of learning, deciding and acting over a period of time.

Coleman (1955) in his study on adoption of soil conservation practices by farmers observed that the adoption of farm practices by farmers was influenced by social, psychological and economic factors of the respondents.

According to Ramsey et al (1959) adoption behaviour involved two components - behavioural, which involves the actual use of the practice and cognitive, which includes obtaining and critical evaluation of the practice in terms of individual situations.

According to Rogers (1962) adoption process is the mental process through which an individual passes- from first hearing of an innovation to its final adoption.

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

2.2 Independent variables and their relationship with dependent variables

Based on the review of literature and discussions with experts, 11 independent variables were selected for the

study. Here an attempt was made to study their relationship with the selected dependent variables. The independent variables selected were:

1) Age

2) Education

3) Scientific orientation

4) Economic motivation

5) Risk orientation

6) Cosmopoliteness

7) Information source used

8) Social participation

9) Innovativeness

10) Contact with extension agency

11) Market orientation

Studies on the independent variables and their association with each of the dependent variables are reviewed hereunder.

2.2.1 Relationship of awareness to the selected independent variables

2.2.1.1 Age

Age refers to the total number of years completed by the individual at the time of interview. The following are ~~the~~ some of the research studies which reported association between age and awareness.

Table 2.1. Review of research studies showing relationship between age and awareness.

Sl. No.	Name of researcher	Year of study.	Relationship
1.	Sabarathnam and Rajaram	1975	No relationship
2.	Viswanathan et al	1975	Positive relationship.
3.	Somasundaram	1976	No relationship
4.	Rao and Reddy	1979.	No relationship
5.	Nandakumar	1980	Negative and significant.
6.	Sarkar and Reddy	1980	No relationship
7.	Naik	1981	Positive relationship
8.	Vijaya	1982	No relationship
9.	Cherian	1984	Negative and significant
10.	Sajeevchandran	1989	Negative relationship

The above review reveals that age of farmers is an important factor which influences awareness. So in this study it is assumed that age will have influence with awareness on improved agricultural practices in pepper.

2.2.1.2 Educational Status

Formal education expands the ability of an individual to use modern communication media. Many researchers studied the association of education and awareness. A review of such studies are presented below:

Table 2.2. Review of research studies showing relationship between education and awareness

Sl. No.	Name of researcher	Year of study	Relationship
*.	Vijayaraghavan	1979	Positive and significant
2.	Balu	1980	Positive and significant
3.	Mani	1980	Positive and significant
4.	Nandakumar	1980	Positive and significant
6.	Sarkar and Reddy	1980	Positive
7.	Naik	1981	Positive
8.	Haraprasad	1982	Positive and significant
9.	Vijaya	1982	Positive
10.	Cherian	1984	Positive and significant
11.	Sajeevchandran	1989	Positive and significant

Majority of the above studies reported positive and significant relationship between education and awareness. In this study it is postulated that there will be a positive relationship between level of education and awareness of improved agricultural practices in pepper.

2.2.1.3 Scientific orientation

The following are some of the studies which reported relationship between scientific orientation and awareness.

Table 2.3 Review of studies showing relationship of Scientific orientation and awareness

Sl. No.	Name of researcher	Year of study	Relationship
1.	Nandakumar	1980	Positive and significant
2.	Aristotle	1981	Positive and significant
3.	Naik	1981	No relationship
4.	Cherian	1984	Positive
5.	Sajeevchandran	1989	Positive and significant

Most of these studies show positive relationship of scientific orientation with awareness. The same pattern of relationship is anticipated in this study also.

2.2.1.4 Economic motivation

The following are some of studies which reported relationship of economic motivation and awareness.

Table 2.4. Review of studies showing relationship of economic motivation and awareness

Sl. No.	Name of researcher	Year of study	Relationship
1.	Nandakumar	1980	Positive and significant
2.	Aristotle	1981	Positive and significant
3.	Sajeevchandran	1989	Positive and significant

The above studies show a positive and significant relationship of economic motivation and awareness. In this study it is postulated that there will be a positive relationship between economic motivation and awareness of improved agricultural practices in pepper.

2.2.1.5 Risk Orientation

The following are some of the studies which reported association with risk orientation and awareness.

Table 2.5 Review of research studies showing relationship between risk orientation and awareness.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Nandakumar	1980	Positive and significant
2.	Aristotle	1981	Positive and significant
3.	Naik	1981	No relationship
4.	Cherian	1984	Positive and significant
5.	Sanjeevchandran	1989	Positive and significant.

Majority of the above studies show the positive relationship between awareness and risk orientation. The same pattern of relationship is anticipated in this study also.

2.2.1.6 Cosmopoliteness

No closely related study to this variable could be reviewed. However, it was decided by the results of judges' relevancy rating to include Cosmopoliteness as one of the variables affecting awareness of improved agricultural practices in pepper growers.

2.2.1.7 Information source used

The following are some of the studies which reported association between information source used and awareness.

Table 2.6 Review of research studies showing relationship between information source used and awareness

Sl. No.	Name of researcher	Year of study	Relationship
.	Rao and Reddy	1979	No relationship
2.	Naik	1981	Positive and significant
3.	Cherian	1984	Positive and significant
4.	Sajeevchandran	1989	Positive and significant

Majority of the above studies show the positive relationship between information source used and awareness. In this study it is postulated that there will be a positive relationship between information source used and awareness of improved agricultural practices in pepper by pepper growers.

2.2.1.8. Social participation

Haraprasad (1982) found that social participation had a positive and significant association with awareness. In this study it is assumed that social participation will have influence on awareness of improved agricultural practices in pepper by pepper growers.

2.2.1.9 Innovativeness

Sajeevchandran (1989) found that innovativeness had a positive association with awareness of improved agricultural

practices. The same pattern of relationship is anticipated in this study also.

2.2.1.10 Contact with extension agency

The following studies reported association between contact with extension agency and awareness.

Table 2.7 Review of research studies which reported association between contact with extension agency and awareness

Sl. No.	Name of researcher	Year of study	Relationship
1.	Khan	1978	Positive relationship
2.	Haraprasad	1982	Positive and significant

The above studies show positive influence of contact with extension agency on awareness. The positive relationship is anticipated in this study also.

2.2.1.11 Market orientation

Sajeevchandran (1989) found that market orientation had a positive and significant association with awareness. Same pattern of relationship is anticipated in this study also.

2.2.2. Relationship of knowledge to the selected independent variables.

2.2.2.1 Age

The following are some of the studies which reported association between age and knowledge.

Table 2.8 Review of research studies showing relationship between age and knowledge

Sl. No.	Name of researcher	Year of study	Relationship
1.	Bhaskaran and Mahajan	1968	Negative
2.	Sing and Prasad	1974	No relationship
3.	Kaleel	1978	No relationship
4.	Thampan	1990	Negative and non-signi-ficant

Majority of the above studies reported a negative relationship between age and knowledge. In this study it is postulated that there will be a negative relationship between age and knowledge of improved agricultural practices in pepper.

2.2.2.2 Educational status

Many researchers studied the association of education and knowledge. A review of such studies are presented below:

Table 2.9 Review of research studies showing the relationship between education and knowledge.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Supe and Salode	1975	Positive and significant
2.	Kaleel	1978	Positive and significant
3.	Ahamed	1981	Significant relationship
4.	Haraprasad	1982	Positive and significant
5.	Balachandran	1983	Positive and significant
6.	Vijayakumar	1983	Positive and significant
7.	Viju	1985	Positive and significant
8.	Thampan	1990	Positive and significant

Majority of the above studies reported positive and significant relationship between education and knowledge. So in this study it is assumed that education will have a positive relationship with knowledge of improved agricultural practices in pepper.

2.2.2.3 Scientific orientation

Supe and Salode (1975) reported that scientifically oriented participant farmers had higher knowledge on the demonstrated practices of jowar under National Demonstration Programme. A similar trend is anticipated in the present study also.

2.2.2.4 Economic motivation

Somasundaram (1976) reported that economic motivation had positive and significant association with knowledge. In this study it is assumed that there will be a positive relationship between economic motivation and knowledge of improved agricultural practices in pepper.

2.2.2.5 Risk Orientation

Viju (1985) reported that risk orientation had a positive and significant association with knowledge. In this study it is assumed that there will be a positive relationship between risk orientation and knowledge of improved agricultural practices in pepper.

2.2.2.6 Cosmopoliteness

The following studies reported association between cosmopoliteness and knowledge.

Table 2.10 Review of research studies showing relationship between cosmopoliteness and knowledge.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Knight and Singh	1975	Positive
2.	Viju	1985	Positive

The above review reveals that cosmopoliteness is an important factor which influences the knowledge of farmers. So in this study it is assumed that cosmopoliteness will have influence on knowledge of improved agricultural practices in pepper.

2.2.2.7 Information source used

The following are some of the studies which reported relationship between information source used and knowledge.

Table 2.11 Review of studies showing relationship of information source used and knowledge.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Menon and Prema	1976	Positive and significant
2.	Prasad	1978	Positive and significant
3.	Sheela	1989	Positive and significant

The above studies reported positive and significant relationship between information source used and knowledge. The same pattern of relationship is anticipated in this study also.

2.2.2.8 Social participation

The following studies reported association between social participation and knowledge.

Table 2.12 Review of research studies showing relationship between social participation and knowledge.

Sl. No.	Name of researcher	Year of Study	Relationship
1.	Copp et al	1968	Positive
2.	Singh and Prasad	1974	Positive
3.	Kaleel	1978	Positive and significant
4.	Haraprasad	1982	Positive and significant
5.	Thampan	1990	Positive

The above studies show the influence of social participation on knowledge. In this study it is assumed that social participation will have influence on knowledge about improved agricultural practices in pepper.

2.2.2.9 Innovativeness

No closely related study to this variable could be reviewed. However, it is assumed that innovativeness will have influence on knowledge about improved agricultural practices in pepper.

2.2.2.10 Contact with extension agency

The studies which reported association between contact with extension agency and knowledge are furnished below.

Table 2.13 Review of research studies showing relationship between contact with extension agency and knowledge.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Knight and singh	1975	Positive
2.	Kaleel	1978	Positive and significant

The above studies show the positive influence of contact with extension agency on knowledge. A similar trend is expected in the present study also.

2.2.2.11· Market Orientation

No closely related study to this variable could be reviewed. However, it is assumed that market orientation will have influence on knowledge about improved agricultural practices in pepper and was selected for the study on the basis of judges' relevancy rating.

2.2.3·Relationship of attitude and selected independent variables.

2.2.3.1· Age

The following are some of the studies which reported association between age and attitude.

Table 2.14   Review   of   research   studies   showing
relationship between and age and attitude

Sl. No.	Name of researcher	Year of study	Relationship
1.	Makkar and Sohal	1974	Positive and significant
2.	Menon and Prema	1976	Positive
3.	Sushamma	1979	No significant relation-ship.
4.	Ravichandran	1980	Negative
5.	Subburaj	1980	Non significant
6.	Kamarudeen	1981	Non significant
7.	Vijayakumar	1983	Positive and significant
8.	Cherian	1984	Positive
9.	Sajeevchandran	1989	Negative and significant

The above review reveals that age is an important factor which influenced attitude. So in this study it is assumed that age will have influence on attitude towards improved agricultural practices in pepper.

2.2.3.2 Educational status

Many researchers studied the association of education and attitude. A review of such studies are presented below:

Table 2.15 Review of research studies showing relationship between (education) and attitude

Sl. No.	Name of researcher	Year of study	Relationship
1.	Das and Sarkar	1970	Positive and significant
2.	Ravichandran	1980	Positive and significant
3.	Subburaj	1980	Positive and significant
4.	Kamarudeen	1981	Positive and significant
5.	Naik	1981	Positive and significant
6.	Vijayakumar	1983	Positive
7.	Cherian	1984	Positive and significant
8.	Sajeevchandran	1989	Positive and significant

Majority of the above studies reported positive and significant relationship between education and attitude. In this study it is postulated that there will be a positive relationship between education and attitude of farmers towards improved agricultural practices in pepper.

2.2.3.3 Scientific orientation

The following are some of the studies which reported relationship between scientific orientation and attitude.

Table 2.16 Review of research studies showing relationship of scientific orientation and attitude.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Kamarudeen	1981	Positive and significant
2.	Naik	1981	No relationship
3.	Cherian	1984	Positive and nonsignificant
4.	Sajeevchandran	1989	Positive and significant

Most of the studies show positive relationship of scientific orientation with attitude. The same pattern of relationship is anticipated in this study also.

2.2.3.4   Economic motivation

The following studies reported relationship between economic motivation and attitude

Table 2.17   Review   of   research   studies   reported
             relationship   between   economic   motivation
             and attitude

Sl. No.	Name of researcher	Year of study	Relationship
1.	Das and Sarkar	1970 ·	Positive and significant
2.	Sajeevchandran	1989	Positive and significant

The above studies show a positive and significant relationship between economic motivation and attitude. In this study it is postulated that there will be a positive relationship between economic motivation and attitude of pepper growers towards improved agricultural practices in pepper.

2.2.3.5   Risk Orientation

The following are some of studies which reported association between risk orientation and attitude.

Table 2.18 Review of research studies showing relationship between risk orientation and attitude.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Kamardueen	1981	Positive and significant
2.	Naik	1981	No relationship
3.	Cherian	1984	Positive and significant
4.	Sajeevchandran	1989	Positive and significant

Majority of the above studies show the positive relationship between risk- orientation and attitude. The same pattern of relationship is anticipated in this study also.

2.2.3.6. Cosmopoliteness

The following studies show association between cosmopoliteness and attitude.

Table 2.19 Review of research studies showing relationship between cosmopoliteness and attitude.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Kamarudeen	1981	Positive
2.	Viju	1985	Positive and significant

The above studies reported a positive relationship between cosmopoliteness and attitude. So it is assumed that there will be a positive relationship between cosmopoliteness and attitude of pepper growers towards improved agricultural practices in pepper.

2.2.3.7 Information source used

The following are some of the studies which reported association between information source used and attitude

Table 2.20 Review of research studies showing relationship between information source used and attitude

Sl. No.	Name of researcher	Year of study	Relationship
1.	Prakash	1980	No significant relationship
2.	Kamarudeen	1981	Positive and significant
3.	Sajeevchandran	1989	Positive and significant

The above review shows that information source used is an important factor which influenced attitude. So in this study it is assumed that information source used will have influence on attitude towards improved agricultural practices in pepper.

2.2.3.8 Social participation

The following are some of the studies which reported association between social participation and attitude.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Das and Sarkar	1970	No significant relationship
2.	Vijaya	1982	Positive and significant
3.	Cherian	1984	Positive and significant

The above review shows that social participation is an important factor which influenced attitude. In this study it is assumed that social participation will have influence on attitude of pepper growers towards improved agricultural practices in pepper.

2.2.3.9 Innovativeness

The following studies show the relationship between innovativeness and attitude

Table 2.22 Review of research studies showing relationship between innovativeness and attitude

Sl. No.	Name of researcher	Year of study	Relationship
1.	Ravichandran	1980	Negative and nonsignificant
2.	Sajeevchandran	1989	Positive

In this study it is assumed that there will be a positive relationship between innovativeness and attitude of pepper growers towards improved agricultural practices in pepper.

2.2.3.10 Contact with extension agency

Kamarudeen (1981) found that contact with extension agency had positive and significant association with attitude. The same pattern of relationship is anticipated in this study also.

2.2.3.11 Market orientation

Sajeevchandran (1989) reported that market orientation had a positive and significant association with attitude. So it is assumed in this study that market orientation will have a positive association with attitude of pepper growers towards improved agricultural practices in pepper.

2.2.4 Relationship between adoption of improved agricultural practices in pepper and the selected independent variables.

2.2.4.1 Age

The following are some of the studies which reported association between age and adoption.

Table 2.23   Review   of   research   studies   showing
relationship between age and adoption

Sl. No.	Name of researcher	Year of study	Relationship
1.	Kaleel	1978	No significant relationship
2.	Pillai	1978	Negative and significant
3.	Sushama	1979	Not significant
4.	ˋAnnamalai	1980	Not significant
5.	Prakash	1980	Negative
6.	Ravichandran	1980	Negative
7.	Kamarudeen	1981	Negative
8.	Sivaramakrishnan	1981	Not significant
9.	Vijayakumar	1983	Negative and significant
10.	Balasubramoniam	1980	Negative and significant
11.	Swaminathan	1986	Negative
12.	Prasannan	1987	Negative
13.	Anithakumari	1989	Not significant

The   above   review   reveals   that   age   is   an   important
factor which influenced adoption.   So in this study it is
assumed   that   age   will   have   influence⁀   on   adoption   of
improved agricultural practices in pepper.

2.2.4.2   Educational status

Many   researchers   studied   the   association   of   education
and adoption.   A review of such studies are presented below:

Table 2.24 Review of research studies showing relationship between education and adoption

Sl. No.	Name of researcher	Year of study	Relationship
1.	Vellapandiyan	1974	Positive and significant
2.	Kaleel	1978	Positive
3.	Pillai	1978	Not significant
4.	Rajendran	1978	Positive and significant
5.	Balasubramoniam	1980	Negative and significant
6.	Manivannan	1980	Positive and significant
7.	Ravichandran	1980	Negative
8.	Kamarudeen	1981	Positive and significant
9.	Haraprasad	1982	Positive and significant
10.	Vijayakumar	1983	Positive and significant
11.	Cherian	1984	Positive and significant
12.	Swaminathan	1986	Not significant
13.	Anithakumari	1989	Positive and significant
14.	Sajeevchandran	1989	Positive and significant

Majority of the above studies reported positive and significant relationship between education and adoption. In this study it is postulated that there will be a positive relationship between level of education and extent of adoption of improved agricultural practices in pepper.

2.2.4.3 Scientific orientation

The following are some of the studies which reported relationship between scientific orientation and adoption.

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Table 2.25 Review of research studies showing relationship between scientific orientation and adoption

Sl. No.	Name of researcher	Year of study	Relationship
1.	Beal and Sibley	1967	Positive
2.	Supe and Salode	1975	Positive and significant
3.	Balu	1980	Negative and nonsignificant
4.	Manivannan	1980	Negative
5.	Kamarudeen	1981	Positive and significant
6.	Swaminathan	1986	No relationship
7.	Anithakumari	1989	Positive and significant
8.	Sajeevchandran	1989	Positive and significant

Most of the above studies show positive relationship of scientific orientation with adoption. The same pattern of relationship is anticipated in this study also.

2.2.4.4 Economic motivation

The following are some of the studies which reported relationship of economic motivation and adoption.

Table 2.26 Review of research studies showing relationship between economic motivation and adoption

Sl. No.	Name of researcher	Year of study	Relationship
1.	Beal and Sibley	1967	Positive
2.	Singh	1968	Positive
3.	Nair	1969	Positive
4.	Singh and Singh	1970	Positive and significant

Sl. No.	Name of researcher	Year of study	Relationship
5.	Rajendran	1978	Positive
6.	Manivannan	1980.	Negative and nonsignificant
7.	Prasannan	1987	Not significant
8.	Anithakumari	1989	Not significant
9.	Sajeevchandran	1989	Positive and significant

Most of the above studies show a positive relationship of economic motivation and adoption. In this study it is postulated that there will be a positive relationship between economic motivation and adoption of improved agricultural practices in pepper.

2.2.4.5 Risk orientation

The following are some of the studies which reported association between risk orientation and adoption.

Table 2.27 Review of research studies showing the relationship between risk orientation and adoption

Sl. No.	Name of researcher	Year of study	Relationship
1.	Singh	1968	Positive and significant
2.	Nair	1969.	Positive
3.	Singh and Singh	1970	Positive and significant
4.	Rajendran	1978	Positive and significant
5.	Balu	1980	Negative and significant
6.	Kamarudeen	1981	Positive and significant

Sl. No.	Name of researcher	Year of study	Relationship
7.	Pillai	1978	Positive and significant
8.	Cherian	1984	Positive and significant
9.	Prasannan	1987	Positive
10.	Anithakumari	1989	Positive and significant

Majority of the above studies show positive relationship of risk orientation and adoption. The same pattern of relationship is anticipated in this study also.

2.2.4.6 Cosmopoliteness

The following studies reported relationship of cosmopoliteness and adoption.

Table 2.28 Review of research studies showing relationship between cosmopoliteness and adoption

Sl. No.	Name of researcher	Year of study	Relationship
1.	Kamarudeen	1981	Positive
2.	Viju	1985	Positive
3.	Prasannan	1987	Positive and significant

The above studies reported positive relationship of cosmopoliteness with adoption. In this study it is assumed that cosmopoliteness will have a positive relationship with adoption of improved agricultural practices in pepper.

2.2.4.7 Information source used

The following are some of the studies which reported association between information source used and adoption.

Table 2.29 Review of research studies showing relationship between information source used and adoption

Sl. No.	Name of researcher	Year of study	Relationship
1.	Singh and Singh	1970	Positive and significant
2.	Naidu	1978	Positive and significant
3.	Prasad	1978	Positive and significant
4.	Sushama	1979	Positive and significant
5.	Prakash	1980	Positive and significant
6.	Prasannan	1987	Positive and significant
7.	Anithakumari	1989	Positive and significant
8.	Sajeevchandran	1989	Positive and significant

The above studies show positive relationship between information source used and adoption. In this study it is postulated that there will be a positive relationship between information source used and adoption of improved agricultural practices in pepper.

2.2.4.8 Social participation

The following are some of the studies which reported association between social participation and adoption.

Table 2.30   Review   of   research   studies   showing
relationship between social participation
and adoption.

Sl. No.	Name of researcher	Year of study	Relationship
1.	Supe and Salode	1975	Not significant
2.	Somasundaram	1976	Positive and significant
3.	Ravichandran	1980	Positive and significant
4.	Kamarudeen	1981	Positive and significant
5.	Pillai	1978	Positive and significant
6.	Prasannan	1987	Positive and significant
7.	Anithakumari	1989	Not significant

Majority of the above studies reported positive and significant relationship of social participation and adoption. In this study it is postulated that there will be a positive relationship between social participation and adoption of improved agricultural practices in pepper.

2.2.4.9 Innovativeness

The following studies reported relationship between innovativeness and adoption.

Table 2.31 Review   of   research   studies   showing
            relationship between innovativeness and
            adoption

Sl. No.	Name of researcher	Year of study	Relationship
1.	Ravi	1974	Positive and significant
2.	Ravichandran	1980	Positive and nonsignificant
3.	Anithakumari	1989	Not significant

The above review reveals that innovativeness is an important factor which is associated with adoption. In this study it is assumed that there will be a positive relationship of innovativeness and adoption of improved agricultural practices in pepper.

2.2.4.10 Contact with extension agency

Kamarudeen (1981) reported that contact with extension agency had a positive and significant relationship with adoption. Same pattern of relationship is anticipated in this study also.

2.2.4.11 Market orientation

Sajeevchandran (1989) found that market orientation had a positive and significant relationship with the extent of adoption. In this study it is postulated that market orientation will have a positive influence on the extent of adoption of improved agricultural practices in pepper.

2.3 Constraints experienced by pepper growers

The following are some of the reported constraints in the adoption of improved agricultural practices in pepper.

Table 2.32 review of research studies which reported constraints in the adoption of improved agricultural practices in pepper

Sl. No.	Reported constraints	Researcher/ Author	Year of study
1.	Extensive pre-valence of pests, diseases	Nair Vinod Sajeevchandran Cherian Kerala Agricultural University Rai	1983 1984 1989 1990 1991 1991
2.	Traditional systems of cultivation	Vinod Kerala Agricultural University Cherian	1984 1989 a 1990.
3.	Lack of sufficient good quality planting materials	Sajeevchandran	1989
4.	Small and marginal size of holdings	Kerala Agricultural University Rai	1991 1991
5.	Lack of aware-ness of improved agricultural practices in pepper	Rajendran	1978

Sl. No.	Reported constraints	Researcher/ Author	Year of study
6.	High cost of produ-ction of inputs.	Sajeevchandran	1989
7.	Inadequate extension support	Sajeevchandran Cherian Kerala Agricultural University	1989 1990 1991
8.	Inadequate and untimely supply of input materials	Sajeevchandran	1989
9.	Inadequate research support	Cherian	1990
10.	Non-availability of literature of improved agricultural practices in pepper	Vinod	1984
11.	Unproductive and senile vines	Vinod Rai	1984 1991
12.	Inadequate soil con-servation methods	Kerala Agricultural University	1991
13.	Inferior genetic base of cultivars	Cherian Rai	1990 1991
14.	Change in ecology	Vindo Kerala Agricultural University	1984 1991
15.	Wide fluctuation in price of pepper.	Cherian	1990

2.4 Theoretical concepts and operational definitions of the selected variables

2.4.1 Awareness

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

In this study awareness is operationally defined as the general information possessed by a respondent about the improved agricultural practices in pepper.

2.4.2 Knowledge

According to Rogers and Shoemaker (1971) knowledge of innovations could create motivation for their adoption.

In this study knowledge is operationalised as the major input for the promotion of attitude towards farming and adoption of improved agricultural practices among pepper growers irrespective of the economic standing and resourcefulness.

2.4.3 Attitude

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

In this study attitude is operationally defined as the degree of positive or negative affect on the farmers towards improved agricultural practices in pepper.

2.4.4 Adoption

Wilkening (1953) postulated the adoption of an innovation as a process composed of learning, deciding and acting over a period of time.

In this study adoption is considered as the overt action of using the selected recommended agricultural practices in the cultivation of pepper.

2.4.5 Age

Age is defined as the number of chronological years the respondent has completed at the time of the study since his birth.

2.4.6 Education

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 affect the manner in which he gathers data and relates himself to his environment. Thus, more the farmers are literate and educated, better will be their proneness to accept innovations in agriculture.

Education in this study is identified with the level of literacy and refers to the ability of the respondent to read and write and the extent of formal schooling.

2.4.7 Scientific orientation

According to Supe (1969) scientific orientation is the degree to which a farmer is oriented to the use of scientific method in decision making in farming.

2.4.8 Economic motivation

The economic motivation is the attitude towards farming as a profit oriented enterprise. Economic motivation would naturally vary with different enterprises the farmers undertake.

In this study economic motivation is operationally defined as the extent to which a farmer is oriented towards achievement of the maximum profit from pepper cultivation.

2.4.9 Risk orientation

The term risk refers to all outcomes which lead to losses or deviation of realisation from expectations. Particularly in agriculture which much depends on natural climate, it is difficult to force risks and provide against uncertainities.

Risk orientation has been operationally defined as the degree to which a pepper grower is oriented towards risk and

uncertainity in adopting improved agricultural practices in pepper cultivation.

2.4.10 Cosmopoliteness

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

In this study cosmopoliteness was operationally defined as the tendency of pepper growers to be in contact with outside village, based on belief that all the needs of an individual cannot be satisfied within his village.

2.4.11 Information source used

According to Wilkening (1953) information source utilization pattern are the source through which information is obtained by an individual. The different sources are mass media, interpersonal localite sources and interpersonal cosmopolite sources.

In this study information source used is conceptualised as the sources through which information on improved agricultural practices in pepper is obtained by a pepper grower.

2.4.12 Social participation

Social participation refers to the position of the respondents in the formal organisation either as a member or office bearer and the degree of involvement in organisational activities.

In this study social participation is operationally defined as the degree of involvement of the pepper growers in formal and informal social organisations.

2.4.13 Innovativeness

According to Rogers and Shoemaker (1971) innovativeness is the degree to which an individual is relatively earlier in adopting new ideas rather than other member of a social system.

It is the degree of an individual's interest to seek changes in farming techniques and to introduce such changes into his own farm operations when found practical and feasible.

2.4.14 Contact with extension agency

This refers to the degree to which an individual contacts with extension agency to get information on agricultural or non-agricultural aspects.

Contact with extension agency has been operationally defined as the frequency in visiting the extension agencies

like scientists, agricultural officers and others in
connection with agricultural activities.

2.4.15 Market orientation

Market orientation has been operationally defined as
the degree to which a farmer is oriented towards the market
in terms of the demand and price of his produce.

2.5 Conceptual frame work for the study.

The main objective of the conceptual frame work
attempted in this section is ⬭ to provide an effective
backdrop against which the theoretical conclusions and the
relationships predicted with the selected characterestics of
this study could be emperically verified (Figure I).

2.6 Hypotheses framed for the study

2.6.1 The null Hypotheses framed for the study of extent
of awareness of improved agricultural practices in pepper by
pepper growers as related to the independent variables
selected for the study were the following:

1. There is no relationship between age of pepper growers
   and the extent of awareness of improved agricultural
   practices in pepper.

2. There is no relationship between education of pepper
   growers and the extent of awareness of improved
   agricultural practices in pepper.

FIG.1. CONCEPTUAL MODEL FOR THE STUDY.

3. There is no relationship between scientific orientation of pepper growers and the extent of awareness of improved agricultural practices in pepper.

4. There is no relationship between economic motivation of pepper growers and the extent of awareness of improved agricultural practices in pepper.

5. There is no relationship between risk orientation of pepper growers and the extent of awareness of improved agricultural practices in pepper.

6. There is no relationship between cosmopoliteness of pepper growers and the extent of awareness of improved agricultural practices in pepper.

7. There is no relationship between information sources used by pepper growers and the extent of awareness of improved agricultural practices in pepper.

8. There is no relationship between social participation of pepper growers and the extent of awareness of improved agricultural practices in pepper.

9. There is no relationship between innovativeness of pepper growers and the extent of awareness of improved agricultural practices in pepper.

10. There is no relationship between contact with extension agency and the extent of awareness of improved agricultural practices in pepper.

11. There is no relationship between market orientation of pepper growers and the extent of awareness of improved agricultural practices in pepper

2.6.2 The null hypotheses framed, for the study of relationship between extent of knowledge about improved agricultural practices in pepper and independent variables selected for the study were the following:

1. There is no relationship between age of pepper growers and the extent of knowledge about improved agricultural practices in pepper

2. There is no relationship between education of pepper growers and the extent of knowledge about improved agricultural practices in pepper.

3. There is no relationship between scientific orientation of pepper growers and the extent of knowledge about improved agricultural pratices in pepper.

4. There is no relationship between economic motivation of pepper growers and the extent of knowledge about improved agricultural practices in pepper.

5   There is no relationship between risk orientation of pepper growers and the extent of knowledge about improved agricultural practices in pepper.

6.   There is no relationship between cosmopolitness of pepper growers and the extent of knowledge about improved agricultural practices in pepper.

7.   There is no relationship between information sources used by pepper growers and the extent of knowledge about improved agricultural practices in pepper.

8.   There is no relationship between social participation of pepper growers and the extent of knowledge about improved agricultural practices in pepper.

9.   There is no relationship between innovativeness of pepper growers and the extent of knowledge about improved agricultural practices in pepper.

10   There is no relationship between contact with extention agency and the extent of knowledge about improved agricultural practices in pepper

11. There is no relationship between market orientation of pepper growers and the extent of knowledge about improved agricultural practices in pepper.

2.6.3 The null hypotheses framed for the study of relationship between attitude of pepper growers towards improved agricultural practices in pepper and independent variables selected for the study were the following:

1 There is no relationship between age of pepper growers and their attitude towards improved agricultural practices in pepper.

2. There is no relationship between education of pepper growers and their attitude towards improved agricultural practices in pepper.

3. There is no relationship between scientific orientation and attitude of pepper growers towards improved agricultural practices in pepper.

4. There is no relationship between economic motivation and attitude of pepper growers towards improved agricultural practices in pepper.

5. There is no relationship between risk orientation and attitude of pepper growers towards improved agricultural practices in pepper.

6. There is no relationship between cosmopoliteness and attitude of pepper growers towards improved agricultural practices in pepper.

7. There is no relationship between information source used and attitude of pepper growers towards improved agriculturaal practices in pepper.

8. There is no relationship between social participation and attitude of pepper growers towards improved agricultural practices in pepper.

9. There is no relationship between innovativeness and attitude of pepper growers towards improved agricultural prctices in pepper.

10 There is no relationship between contact with extension agency and attitude of pepper growers towards improved agricultural practices in pepper.

11. There is no relationship between market orientation and attitude of pepper growers towards improved agricultural practices in pepper.

2.6.4 The null hypotheses framed for the study of relationship between extent of adoption of improved agricultural practices in pepper and independent variables selected for the study were the following:

1. There is no relationship between age of pepper growers and extent of adoption of improved agricultural practices in pepper.

2. There is no relationship between education of pepper growers and the extent of adoption of improved agricultural practices in pepper.
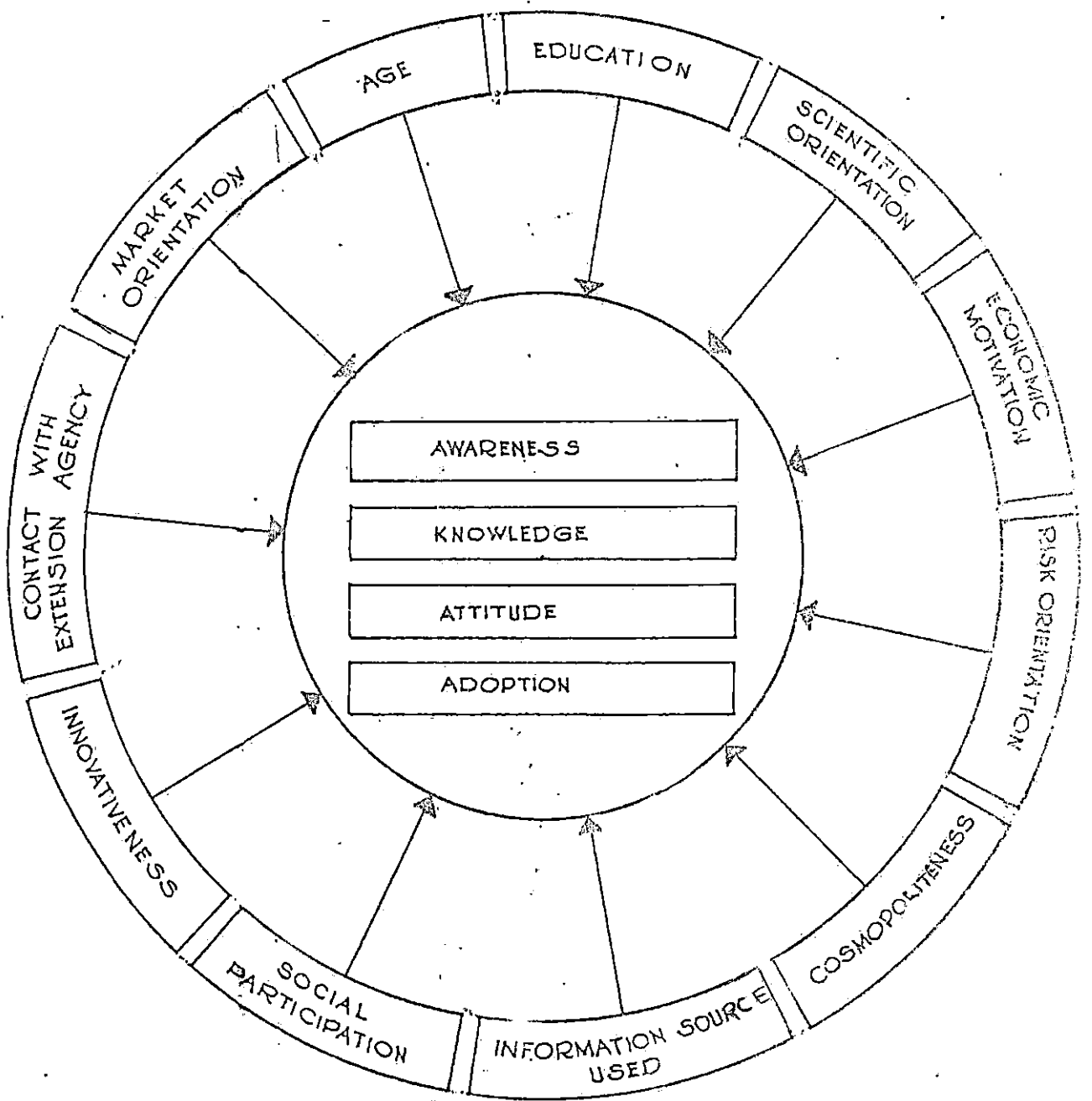
3 There is no relationship between scientific orientation of pepper growers and the extent of adoption of improved agricultural practices in pepper.

4. There is no relationship between economic motivation of pepper growers and the extent of adoption of improved agricultural practices in pepper.

5 There is no relationship between risk orientation of pepper growers and the extent of adoption of improved agricultural practices in pepper

6. There is no relationship between cosmopoliteness of pepper growers and the extent of adoption of improved agricultural pratices in pepper.

7. There is no relationship between information sources used by pepper growers and the extent of adoption of improved agricultural practices in pepper.

8 There is no relationship between social participation of pepper growers and the extent of adoption of improved agricultural practices in pepper.

9   There is no relationship between innovativeness of pepper growers and the extent of adoption of improved agricultural practices in pepper.

10.   There is no relationship between contact with extention agency by pepper growers and the extent of adoption of improved agricultural practices in pepper.

11.   There is no relationship between market orientation of pepper growers and the extent of adoption of improved agricultural practices in pepper.

METHODOLOGY

CHAPTER III

METHODOLOGY

The materials and methods employed in this study are
presented under the following sections.

1. Location of the study.

2. Selection of locale

3. Selection of respondents

4. Selection of variables for the study.

5. Selection of improved agricultural practices
   in pepper:

6. Measurement of variables

7. Techniques employed in data collection

8. Statistical methods used.

3.1 Location of the study

The study was conducted in Idukki district of Kerala
State based on the criterion that the district was having the
maximum area under pepper cultivation.

3.2 Selection of locale

The selection of respondents for the study was based on the
stratified two stage sampling procedure as follows:

Idukki district consists of three agricultural
sub-divisions, namely, Thodupuzha, Peermade and Adimali.
From each sub-division, one block which was having maximum
area under pepper cultivation was selected. The blocks
selected were Idukki, Kattappana and Adimali respectively.

Altogether ten Krishibhavans were selected randomly, three each from Idukki and Adimali and four from Kattappana. The list of Krishibhavans selected for the study with the name of the corresponding block and sub-division is given in Appendix I. The map showing the location of the study is presented in Fig.2.)

3.3 Selection of respondents

A sample of 200 respondents for the study was selected randomly with 20 farmers at each of the selected 10 krishibhavans with the help of the list of pepper growers identified by the Department of Agriculture.

3.4. Selection of variables for the study

1) Dependent variables

The objective of the study necessitated to select the following dependent variables for the study, namely,

(i) Awareness (ii) Knowledge (iii) Attitude and (iv) Adoption.

2) Independent variables

Based on the review of literature and discussion with experts, 25 variables which had relationship with the selected dependent variables were identified. These variables were again subjected to relevancy rating by judges to select the most relevant ones as perceived by the judges.

FIG. 2. MAP SHOWING THE LOCATION OF STUDY IN IDUKKI DISTRICT.

ERNAKULAM DISTRICT

ADIMALI

KOTTAYAM DISTRICT

IDUKKI

KATTAPPANA

TAMIL NADU

MAP OF KERALA

ARABIAN SEA

IDUKKI Dt.

PATHANAMTHITTA DISTRICT

〜〜〜 STATE BOUNDARY

‐‐‐‐ DISTRICT BOUNDARY

||||| STUDY AREA
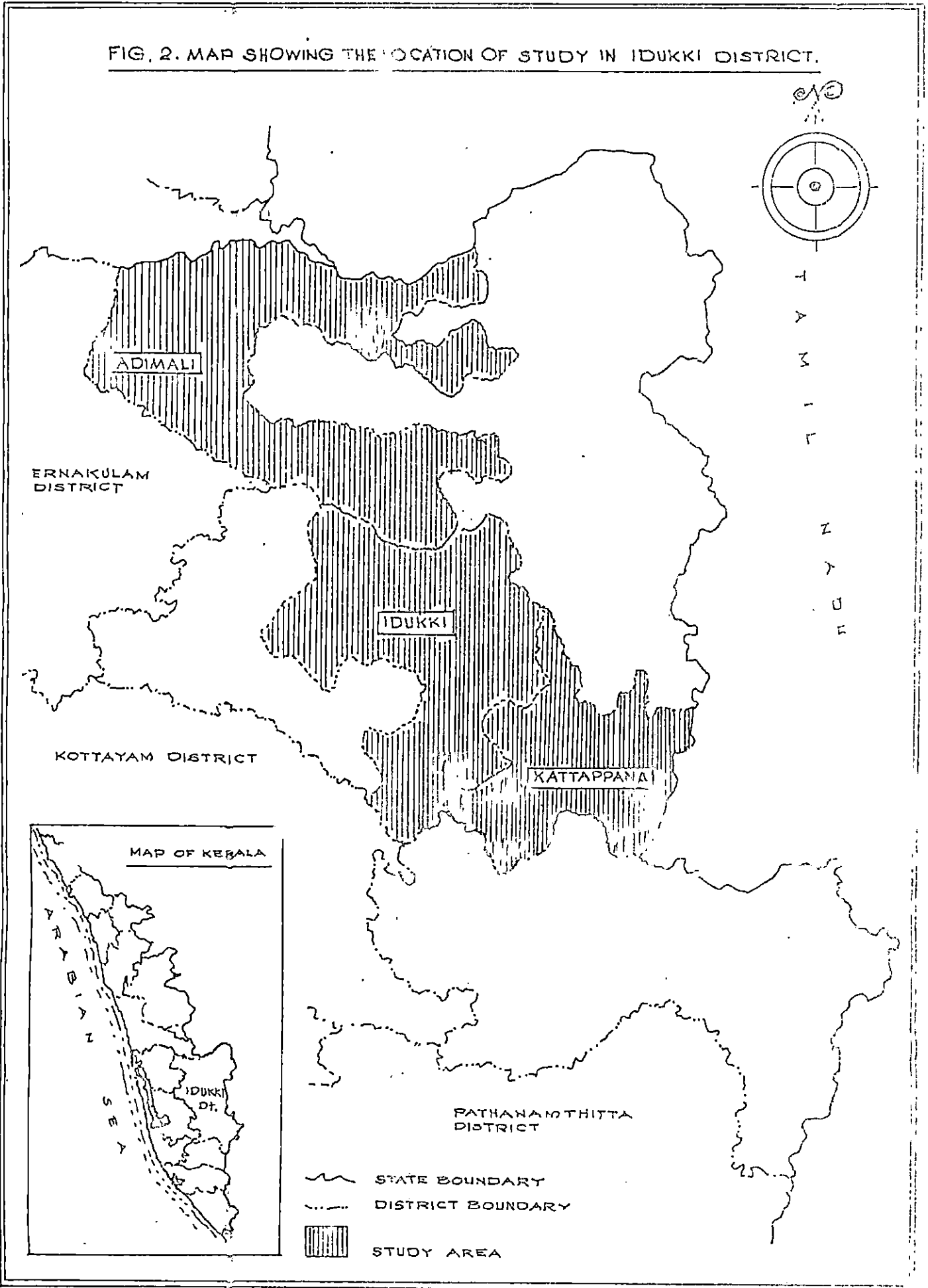
A questionnaire was prepared to collect the responses from judges in a five point continuum with response pattern "Most relevant", "More relevant", "Relevant","Less relevant" and "Least relevant" with scores 5, 4, 3, 2 and 1 respectively. A copy of the questionnaire is furnished in Appendix II.

Experts from the Kerala Agricultural University were selected as judges. Copies of the questionnaire with clear instructions for filling up the questionnaire were sent to 30 judges. A self addressed stamped envelope was also enclosed along with the questionnaire for getting back the filled up questionnaire from the respondents. Twentytwo judges responded. The scores assigned by these judges were added up for each variable. The relevancy weightage for each variable was calculated as shown under.

Relevancy weightage = $\dfrac{\text{Total score obtained for a variable}}{\text{Maximum possible score for that variable}}$

Thus the relevancy weightage could range from 0.2 to 1.0 under the scoring pattern adopted. The relevancy weightage obtained for each of the 25 variables is furnished in Appendix II.

In the present study, relevancy weightage secured by the variables ranged from a minimum of 0.36 to a maximum of 0.96. The average of 0.36 and 0.96 was taken as the cutting point for the selection of variables as done by Kunju (1989). Thus all the variables which secured a relevancy weightage of 0.66 and above were selected for inclusion in the study. The independent variables selected for the study are listed below:

1. Age

2. Education

3. Scientific orientation

4. Economic motivation

5. Risk orientation

6. Cosmopoliteness

7. Information source used

8. Social participation

9. Innovativeness

10. Contact with extension agency

11. Market orientation.

3.5 Selection of improved agricultural practices in pepper

Based on the popularity of practices and the opinion of experts of the Kerala Agricultural University and Subject Matter Specialists of the State Department of Agriculture, the following improved agricultural practices in pepper were selected for the study.

1. Use of high yielding varieties

2. Use of recommended spacing

3. Use of organic manures

4. Use of chemical fertilizers

5. Use of plant protection chemicals

3.6.1. Measurement of dependent variables

1. Awareness

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

Khan (1978) measured awareness by asking the respondents whether they were aware of certain measures of the Government for improving the condition of small farmers.

Salunkhe (1978) measured awareness of farmers by asking questions on the activities of Small Farmers Development Agency (S.F.D.A.), namely publicity about S.F.D.A., methods of getting benefits, methods of granting subsidies; supervision of loan and arranging services, supplies and technical guidance.

For the purpose of this study, the method followed by Salunkhe (1978) was accepted with slight modification for measuring the awareness of pepper growers on improved agricultural practices in pepper. In consultation with officials of the Department of Agriculture and Experts of the Kerala Agricultural University and on the basis of review of relevant literature, a list of questions was prepared. The questions were pre-tested among 30 farmers in a non-study area in Peruvanthanam Panchayat of Peermade sub-division. From the list of questions, eight questions were selected on the basis of this variation in response and is given in Appendix III.

These questions were administered to the respondent farmers and one score was given to every response of "yes" and zero to the response "no". The mean and standard deviation of the awareness score were calculated. The respondents were categaorised into low, medium and high levels based on mean ± standard deviation.

2. Knowledge

According to Cronbach (1949) Knowledge test is one in which procedures and apparatus and scoring have been fixed so that precisely the same test can be given at different times and places.

A standardized knowledge test defined by Noll (1957) is one that has been carefully constructed by experts in the light of acceptable objectives or purposes and procedures for administering, scoring and interpreting. Scores are specified in detail so that the results should be comparable and norms and averages for different age and status have been pre-determined.

Nair (1969) measured knowledge level of farmers on recommended package of practices of rice using Teacher-made test with multiple choice questions.

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

$$\frac{X_i \times 100}{n}$$

where X_i = Number of correct answers

      n = Total number of questions

Nachiappan and Srinivasamurthy (1976) used the teacher-made test to find out the knowledge levels of small farmers with respect to farm technology. They calculated knowledge index by the following formula:

$$\text{Knowledge index} = \frac{\text{Actual score obtained}}{\text{Maximum score allotted}} \times 100$$

In the present study a teacher-made test was developed for measuring the knowledge of pepper growers on improved agricultural practices in pepper using the procedure detailed below. Statements were formulated based on the review of literature and discussion with Subject Matter Specialists in the Department of Agriculture and Scientists of Kerala Agricultural University. These statements formed the items to be included in the knowledge test. Ten items were constructed to develop a knowledge test which is given in Appendix III.

The maximum score obtained by a respondent for the test was ten and minimum score was one. The mean and standard deviation of the knowledge score were calculated. The respondents were categorised into low, medium and high levels based on Mean ± standard deviation.

3. Attitude

Attitude scale provides one means of assessing the degree of affect that individuals may associate with some psychological object. In this study, attitude of pepper growers towards improved agricultural practices in pepper was measured using the attitude scale constructed for the purpose. The items for the attitude scale are called

statements. Based on the review of literature and discussions with experts 50 statements regarding different aspects of improved agricultural practices in pepper were collected so as to make the respondents reflect their attitude through their responses. These statements were edited by eliminating those which failed to meet the standards by comparing to the criteria for selection of attitude statements as given by Edwards (1957). Thus 39 statements were finally retained after screening.

The method of Equal Appearing Intervals as described by Thurstone and Chave (1929) was used to determine the scale values of the attitude statements. For this the 39 statements were sent to a group of judges comprising experts of various Departments of Agricultural College, Vellayani and State Department of Agriculture. They were asked to rate each statement on a seven point continuum ranging from "Most favourable" through "Neutral" to "Most unfavourable". The judges were asked to make sure that they do not express their opinion but their estimation of degree of favourableness or unfavourableness expressed by each statement only.

Tabulations were then made indicating the number of judges who placed each item in each category. From these data cumulative proportions were computed. The median values in terms of scale units with reference to the ogives give the scale value for the individual items.

The scale value of each was computed using the formula:

$$S = 1 + \frac{(0.50 - \leq ph)}{Pw} \times i$$

Where S = median or scale value of the statement

l = the lower limit of interval in which the median falls.

$\leq$ph = the sum of the proportions below the interval in which the median falls

Pw = the proportion within the interval in which the median falls

i = the width of the interval and assumed to be equal to 1.0

A statistical criterion of ambiguity according to Edwards and Kenney (1949) in this technique is the distance between the points on the scale marking of the 25th and 75th percentiles. The distance under quartile range is called the "Q" value. "Q" values were worked out for the 39 statements and finally 16 statements with low "Q" values were retained to form the final scale for measuring attitude towards improved agricultural practices in pepper cultivation. A low "Q" value indicated that there is good agreement among the judges while a high "Q" value indicated lack of agreement. The statements with the

lowest "Q" value is belived to be the least ambiguous. Thus 16 statements were finally selected to measure the attitude of pepper growers towards improved agricultural practices in pepper and are given in Appendix III.

Reliability of Scale

A scale is said tobe reliable when it produces results with high degree of consistency when administered to the same respondents. In this study reliability of the scale was determined by split half method. The scale was administered to 30 pepper growers of non-sample area in Peruvanthanam Panchayat of Idukki District. The scale administered to the above respondents was divided into two halves, based on odd - even number of statements. Two sets of scores were derived from the same respondents and these were correlated. The co-efficient of correlation (r) between the two scores was found to be 0.812, highly significant. Hence it was concluded that the scale was reliable.

Validity of the Scale

The validity of the scale means the fidelity with which it measures what it is supposed to measure. The developed scale was tested for the following two types of validity.

Content Validity

The main criterion for content validity is how well the contents of the scale represents the subject matter under study. Since the items selected were from the universe of contents, it was ensured that the items covered all aspects of the improved agricultural practices in pepper and the scale had content validity.,

Construct Validity

The construct validity was tested by calculating the correlation coefficient between the scores contained by administering the scale attitude towards HYV paddy and attitude score of pepper growers towards improved agricultural practices in pepper. The attitude scores obtained by administering the scale attitude towards HYV paddy of the 30 respondents were calculated and correlation coefficient was found out by comparing them with the scores on attitude towards improved agricultural practices in pepper. The calculated "r" value 0.866 was found significant. Thus it was proved that scale had construct validity also.

The attitude scale thus developed was incorporated in the interview schedule and administered to 200 respondents of the study area and their responses were collected on a five point continuum ranging from 'strongly agree' to 'strongly disagree'. Scores were given as 5,4,3,2 and 1 for Strongly agree, Agree, Undecided, Disagree and Strongly disagree responses respectively for positive statements. The scoring pattern was reversed for the negative statements. The favourable and unfavourable attitude statements were set at a random order and respondents were asked to respond according to their degree of agreement or disagreement to each statement.

Attitude scores of all the statements were added together. The mean and standard deviation of the attitude score were calculated. The respondents were categorised into Low, Medium and High levels of attitude towards improved agricultural practices in pepper based on the Mean ± standard deviation.

4) Extent of adoption

Wilkening (1952) used an index for measuring the adoption of improved farm practices. The index of adoption used was the proportion of practices adopted to

the total number of practices applicable for that farmer.

Marsh and Colemen (1955) used "practice adoption scores" computed as the percentage of applicable practices adopted.

Fliegel (1956) constructed an "index of adoption" of farm practices using the correlation of several adoption variables. He used factor analysis of each of the 11 factors selected. A score of one was given for adoption and zero for non-adoption.

Supe (1971) developed a scale, namely, cotton practice adoption scale. He selected the cultivation practice of cotton and for each practice the total score for complete adoption was six. The practices devisible were assigned partial scores for partial adoption.

In the present study, the extent of adoption was measured by using the adoption quotient suggested by Singh and Singh (1974) which is a modification of the procedure followed by Chattopadhyaya (1963). Five improved cultivation practices were chosen from the package of practices recommended by the Kerala Agricultural University(1989b) and are given in Appendix III. The selection of improved agricultural practices was done in consultation with experts of both the Department of

Agriculture and Kerala Agricultural University. The adoption quotient for each respondent was calculated using the formula.

$$\text{Adoption quotient} = \frac{e1/P1 + e2/P2 + \ldots en/pn}{N} \times 100$$

Where $e1/P1$ = $\dfrac{\text{extent of adoption of a practice}}{\text{Potentiality of adoption of that practice}}$

N = Total number of practices applicable to the respondent.

The potentiality of adoption is conceived as the maximum degree to which a farmer can adopt a practice depending on the maximum of resources which he commands. Extent of adoption is conceived as to degree to which a farmer has actually adopted a practice. When the extent of adoption equals the potentiality, the adoption is maximum and when the extent is nil, the adoption is nil.

3.6.2 Measurement of independent variables

1. Age

Age was operationalised as the number of chronological years the respondent had completed at the time of this study since his birth.

Prasad (1978) measured age as the number of years the respondent had completed at the time of interview.

In this study, age was measured as the number of years the respondent had completed at the time of interview since his date of birth.

2. Education

Education refers to the extent of literacy obtained by the respondent at the time of the study.

The level of education was measured with the help of socio-economic status scale developed by Trivedi (1963). According to this the pepper growers were categorised as illiterate, can read only, can read and write, primary level, Middle school level, High school level, Graduates and above. The scoring procedure was as follows:-

Level	Score
Illiterate	0
Can read only	1
Can read and write	2
Primary level	3
Middle school level	4
High school level	5
Graduate and above	6

3.Scientific orientation

Scientific orientation was operationalised as the degree to which a farmer is oriented to the use of scientific methods in decision making in pepper cultivation.

Supe (1969) measured scientific orientation with the help of a scale developed for the purpose. The scale consists of six statements of which one was negative. The responses were collected on a five point continuum ranging from "Strongly agree" to "Strongly disagree". The scores were given as follows:

Response category	Score
Strongly agree	7
Agree	5
Undecided	4
Disagree	3
Strongly disagree	1

The scoring pattern was reversed for the negative statement . The total score obtained by each respondent was considered as the score of his scientific orientation.

4) Economic motivation

Economic motivation refers to the attitude of farmers towards farming as a profit oriented enterprise.

Economic motivation is operationalised as farming of profit maximisation and relative value placed by a farmer on economic ends.

In this study, economic motivation was measured using the scale developed by Supe (1969). Theis scale consisted of six statements of which five were positive and one negative. Responses were calculated on a five point continuum with scores as follows:-

Response category	Score
Strongly agree	7
Agree	5
Undecided	4
Disagree	3
Strongly disagree	1

Scoring pattern was reversed for negative item. The total score of each respondent was calculated and considered as the score of his economic motivation.

5) Risk orientation

Supe (1969) defined risk preference as the degree to which the farmer is oriented towards risk and uncertainty and also as the courage to face the problems in farming.

In this study risk orientation was operationalised as the degree to which a pepper grower is oriented towards encountering risk and uncertainty in adopting improved agricultural practices in pepper.

In the present study, risk orientation was measured by the risk preference scale developed by Supe (1969). This scale consists of six statements of which two were negative. The responses were collected on a five point continuum with scores as follows:-

Response category	Score
Strongly agree	7
Agree	5
Undecided	4
Disagree	3
Strongly disagree	1

The scoring pattern was reversed for negative statements. Total score obtained by a respondent was considered as his score for risk orientation.

6. Cosmopoliteness

Rogers (1962) defined cosmopoliteness as the degree to which an individual's orientation is external to a particular social system.

In this stgudy, cosmopliteness was operationally defined as the tendency of the pepper growers to be in contact with outside world based on belief that all the needs of an individual cannot be satisifed within his village.

The procedure followed by Desai (1981) was used to measure the extent of cosmopoliteness. The two dimensions of the variable measured were:

(a)The frequency of visit to the nearest town in a month. ; and

(b)The purpose of visit to the town in a month.

The scoring pattern was as follows.

(a) Frequency of visit

Response category	Score
i.Never	0
ii.Occasionally	1
iii.Once in a month	2
iv.Once in a fortnight	3
v.Once in a week	4
vi.Two or more times in a week	5

(b) Purpose of visit

Response category	Score
i. All visits relating to agriculture	5
ii. Some relating to agriculture	4
iii. Personal/Domestic matters	3
iv. Entertainment	2
v. Others	1
vi. No response	0

The total score obtained by the respondent for frequency of visit and purpose of visit was taken as the score of cosmopoliteness.

7) Information source used

Information source used was operationalised as the sources through which information on improved agricultural practices in pepper is obtained by a pepper grower.

In the present study the extent of use of information source was measured for each respondent in the following manner · The sources of information were listed and they were grouped into three categories as done by Wilkening (1962) The three categories are:- (a) Mass media; (b) Interpersonal cosmopolite source and (c) Interpersonal localite source.

These were treated as a single variable and the extent of use was measured. Each respondent was asked to indicate how often he got information on agricultural technology from each of the listed source. Responses were collected as follows:

Response category	Scores
Once in a week	3
Once in a month	2
Once in two months	1
Never	0

Total score obtained by the respondent for each of the three groupings were added together and taken as the score of his information source used.

8) Social participation

Sadamate (1978) defined social participation of the respondents as participation in social institutions as a member or as an office bearer.

In this study, social participation is operationally defined as the degree of involvement of the pepper grower; in social organisations as a member or as an office bearer.

In the present study, the socio-economic status scale of Trivedi (1963) with suitable modification was used to measure social participation. Farmers were asked the question whether they were participants in any of the organisation and their extent of participation in the organisations. Responses were collected as follows:

Response category	Score

   i Memebership in one organisation   .. 1

  ii.Membership in more than one organi- .. 2
     sation.

iii. Office bearer in one organisation .. 3

 iv. Office bearer in more than one   .. 4
     organisation.

  v. Distinctive features(office bearer
     at State level or National level) .. 5

9) Innovativeness

According to Rogers and Shoemaker (1971), innovativeness is the degree to which an individual is relatively earlier in adopting new ideas than, the other members of a social system. An innovative farmer will be eager to seek changes in farming techniques and to introduce them in his own farm, when found feasible and potential.

As this variable denotes covert behaviour, it was measured in terms of covert behaviour closely associated with change. The innovativeness scale developed by Feaster (1968) with the modification as done by Prasad (1983) was used in this study to measure innovativeness.

This scale consisted of eight statements of which first four statements were positive and the rest were negative.The responses were collected on a three point continuum and the scores were given as follows:

i) Yes   .. 2 (ii) Undecided .. 1 (iii) No   .. 0,

for positive statements and scoring pattern reversed for negative statements.

The total score for eight statements was taken as the score for innovativeness of that respondent.

10) Contact with extension agency

This refers to the degree to which an individual contacts extension agency to get information on agricultural or non-agricultural aspects.

This variable was measured in terms of frequency and purpose of meeting the change agency by farmers.

The following scoring procedure was adopted as done by Sirajudeen (1980).

(a) <u>Awareness</u>

<u>Scores</u>

i. Not aware of extension agency   - 0

ii. Aware of extension agency   - 1

(b) <u>Frequency of contact</u>

<u>Score</u>

  i. Beyond 3 months   1

 ii Once in 3 months   2

iii. Once in a month   3

 iv Once in 15 days   4

  v. Once in a week   5

(c) <u>Purpose of contact</u>

  i. Non agriculturaal   1

 ii. To avail input assistance   2

iii. To avail subsidies and agricultural
     implements   3

 iv To get technical guidance   4

The scores obtained for a, b and c were added up to obtain the total score for this variable.

11) Market orientation

Market orientation was operationally defined as the degree to which a farmer is oriented towards the market in terms of the demand and price of the produce.

In this study, market orientation was meaasured by using the scale developed for this purpose. The scale consists of six statements of which four statements were positive and two negative. The following scoring procedure was adopted as done by Sajeevchandran (1989).

Response category	Scores
Strongly agree	5
Agree	4
Undecided	3
Disagree	2
Strongly disagree	1

Scoring pattern was reversed for negative items The total score secured by each respondent was considered as his score of market orientation.

3.6.3 Constraints as perceived by the pepper growers in the adoption of improved agricultural practices.

Based on the review of relevant literature and discussions with the experts of both the State Department of Agriculture and the Kerala Agricultural University the constraints faced by pepper growers were collected separately. The important constraints experienced by the pepper growers were finally selected and these constraints were enlisted in the interview schedule.

The responses to each constraint was obtained on a three point continuum, namely, Most important, Important and Least important. In order to rank the constraints, a cumulative index was calculated. For this, weightages of 3, 2 and 1 were given to the responses "Most important","Important" and "Least important" respectively.

The frequency of responses under each category was multiplied with the corresponding weightage and added to get a cumulative index for the particular constraint. The ratio between the cumulative index and the frequency of responses for each constraint was worked out. Based on the ratio, the constraints were ranked in each case. The perception of pepper growers on the solutions of the most important constraint was also recorded.

3.7. Techniques employed in data collection

Personal interview method was used for colleting data from the farmer respondents. The draft of the interview schedule was pre-tested in a pilot study conducted in a non-sample area in Peruvanthanam Panchayat of Idukki district and suitable modifications were made accordingly.

Data collection was carried out during June-July 1992. The interview schedule was translated into Malayalam and the farmers were individually interviewed and their responses recorded.

3.8 Statistical methods employed.

Data collected from the pepper growers were coded, tabulated and analysed using the following statistical techniques. Data were analysed using the computer facilities available at the Department of Agricultural Statistics of the College of Agriculture, Vellayani, Thiruvananthapuram.

3.8.1 Percentages

Percentages were calculated for finding out the distribution of the respondents according to their personal and socio-psychological characteristics.

3.8.2 Step-wise regression analysis

Step-wise regression analysis was done to obtain information regarding the best subgroup of variables and the relative contribution of each of these independent variables (X_i) in contributing to the variations to the dependent variables (Y_i).

Stepwise regression analysis selects the best subset of variables in predicting variations in the dependent variables in such a manner that

(a) it yields the largest multiple correlation among all subsets.

(b) Inclusion of the remaining variable does not significantly improve the prediction of the dependent variable.

RESULTS

CHAPTER IV

RESULTS

The results of the study in accordance with the objectives set earlier are presented in this Chapter under the following sections.

1. Extent of awareness of improved agricultural practices in pepper by pepper growers.

2. Extent of knowledge about improved agricultural practices in pepper by pepper growers.

3. Attitude of pepper growers towards improved agricultural practices in pepper.

4. Extent of adoption of improved agricultural practices in pepper by pepper growers.

5. Relationship of the selected socio-psychological and economic characteristics of pepper growers with their awareness, knowledge, attitude and adoption of improved agricultural practices in pepper.

6. Relative importance of the selected socio-psychological and economic characteristics in contributing to the awareness, knowledge, attitude and adoption of improved agricultural practices in pepper.

7. Constraints in the adoption of improved agricultural practices in pepper as perceived by pepper growers and solutions to overcome the constraints.

.4.1. <u>Extent of awareness of improved agricultural practices in pepper by pepper growers.</u>

The awareness score of the pepper growers obtained for the improved agricultural practices in pepper are given in Table 4.1.

Table 4.1. Distribution of pepper growers according to their extent of awareness of improved agricultural practices in pepper

(n = 200)

Awareness score		Category	Frequency	Percentage
Below	4.26	Low level	43	21.50
Between And	4.26() 7.31	Medium level	137	68.50
Above	7.31	High level	20	10.00
Total			200	100.00

$\bar{X}$ = 5.785   S.D. = 1.529

An appraisal of Table 4.1 reveals that majority of the pepper growers (68.5 per cent) had a medium level of awareness followed by 21.5 per cent who had a low level of awareness of improved agricultural practices in pepper. Only 10 per cent of the pepper growers had a high level of awareness of improved agricultural praactices in pepper. Hence it is inferred that majority of the pepper growers had medium level of the awareness of improved agricultural practices in pepper.

4.2 Extent of knowledge about improved agricultural practices in pepper by pepper growers.

The knowledge score of the respondents obtained for improved agricultural practicies in pepper are given in Table 4.2.

Table 4.2. Distribution of pepper growers according to their extent of knowledge about improved agricultural practices in pepper

(n = 200)

Knowledge score	Category	Frequency	Percentage
Below 5.92	Low level	32	16
Between 5.92 and 9.61	Medium level	148	74
Above 9.61	High level	20	10
Total		200	100

$\bar{X}$ = 7.765   S.D. = 1.843

Table 4.2 reveals that majority of the pepper growers (74 per cent) had a medium level of knowledge followed by 16 per cent of them who had a low level of knowledge about improved agricultural practices in pepper. Only 10 per cent of the pepper growers had a high level of knowledge about improved agricultural practices in pepper. Hence it is inferred that majority of the pepper growers had medium level of knowledge about improved agricultural practices in pepper.

4.3 Attitude of pepper growers towards improved agricultural practices in pepper.

The attitude score of the pepper growers towards improved agricultural practices in pepper for the sample studied are given in Table 4.3.

Table 4.3.Distribution of pepper growers according to their attitude towards improved agricultural practices in pepper.

(n = 200)

Attitude score	Catgory	Frequency	Percentage
Below 3.49	Low level	21	10.5
Between 3.49 and 4.65	Medium level	178	89.0
Above 4.65	High level	1	0.5
Total		200	100.00

$\overline{X}$ = 4.068   S.D. = 0.579

Table 4.3 reveals that majority of the pepper growers (89 per cent) had a medium level of attitude followed by 10.5 per cent who had a low level of attitude towards improved agricultural practices in pepper. Only 0.5 per cent of the pepper growers had a high level of attitude towards improved agricultural practices in pepper. Hence it is inferred that majority of the pepper growers had a medium level of attitude towards improved agricultural practices in pepper.

4.4. Extent of adoption of improved agricultural practices in pepper by pepper growers.

The adoption score of pepper growers on improved agricultural practices are given in Table 4.4.

Table 4.4. Distribution of pepper growers according to the extent of adoption of improved agricultural practices in pepper.

(n = 200)

Adoption score	Category	Frequency	Percentage
Below 26.1	Low level	38	19.00
Between 26.1 and 59.67	Medium level	129	64.50
Above 59.67	High level	33	16.50
Total		200	100.00

$\bar{X}$ = 42.885   S.D. = 16.781

Table 4.4 reveals that majority of the pepper growers (64.50 per cent) were medium level in adoption, followed by 19.00 per cent of pepper growers who were low adopters of improved agricultural practices in pepper. Only 16.5 per cent of the pepper growers belonged to the high adoption category. Hence it is inferred that majority of the pepper growers were medium level in adoption of the improved agricultural practices in pepper.

The adoption percentage of improved agricultural practices in pepper growers are given below.

Table 4.4.2. Adoption of improved agricultural practices in pepper by pepper growers.

Sl.No.	Improved agricultural practices	Percentage of adoption.
1)	Use of High Yielding Varieties	11.4%
2)	Use of recommended spacing	41.29%
3)	Use of Organic Manures	94.5%
4)	Use of chemical fertilizers	
	a) Nitrogen	53%
	b) Phosphorus	56%
	c) Potash	47%
5)	Use of Plant Protection chemicals against	
	a) Pests	3.75%
	b) Diseases	85.63%

From the above table it could be seen that more than 94 per cent of pepper growers in the study area have applied organic manures for pepper and 85.43 per cent of them have taken control measures against diseases of pepper. Eventhough a high rate of adoption is obtained to this practice, about 6.7 per cent of the pepper growers are of the opinion that Bordeaux mixture is not effective against quick wilt and other diseases of pepper. On enquiry it could be understood that some of the farmers have used excess lime in preparing Bordeaux mixture. The number and time of spraying were also not followed correctly. These might be the reasons for the poor performance of the above fungicide.

Adoption of fertilizer is around 50 per cent among pepper growers. Nearly five per cent of farmers expressed that they have applied organic manures in plenty and felt no need for fertilizer application. Three per cent of the pepper growers felt that their land is very fertile and were reluctant to apply fertilizer to pepper crop. There is a general trend among some of the pepper growers that application of fertilizer to pepper results in an increased incidence of pests and diseases.

Adoption of recommended spacing is only 41.29 per cent. The spacing is strictly followed only in plantations where pepper is cultivated as a monocrop.

High yielding varieties are cultivated in 11.4 per cent of the area. Many of the pepper plantations in Idukki have been established by the settlers in forest land and in some areas the then existing Cardamom Plantations were converted into pepper plantations. Initially, the forest shade trees were used as standards to plant pepper. The climatic conditions in these gardens were conducive for the spread of diseases. The excess shade in these gardens resulted in an excessive vegetative growth and poor performance of high yielding varieties. This created a negative impression towards Panniyoor varieties, which may be the reason for low adoption.

The adoption of control measures against pests of pepper is only 3.75 per cent. Nearly 13 per cent of pepper growers expressed that the crop loss due to pests is meagre, and hence they are reluctant to adopt proper control measures. This may be the reason for low adoption of this practice.

4.5 Relationship of the selected socio-psychological and economic characteristics of pepper growers with their awareness,knowledge, attitude and adoption of improved agricultural practices in pepper.

Correlation analysis was done to find out the intensity of relationship between the independent variables and each of the dependent variable.

4.5.1. Correlation between awareness of improved agricultural practices in pepper and the independent variables.

The results of the zero - order correlation between awareness of improved agricultural practices in pepper and independent variables are given in Table 4.5 and are diagrammatically presented in Figure 3.

Table 4.5 Correlation between awareness of improved agricultural practices in pepper and the independent variables.

Variable No.	Independent variables	Correlation Coefficient 'r'
X_1	Age	-0.3605^{**}
X_2	Education	0.6597^{**}
X_3	Scientific orientation	0.5352^{**}
X_4	Economic motivation	0.3380^{**}
X_5	Risk orientation	0.3967^{**}
X_6	Cosmopoliteness	0.5163^{**}
X_7	Information source used	0.5079^{**}
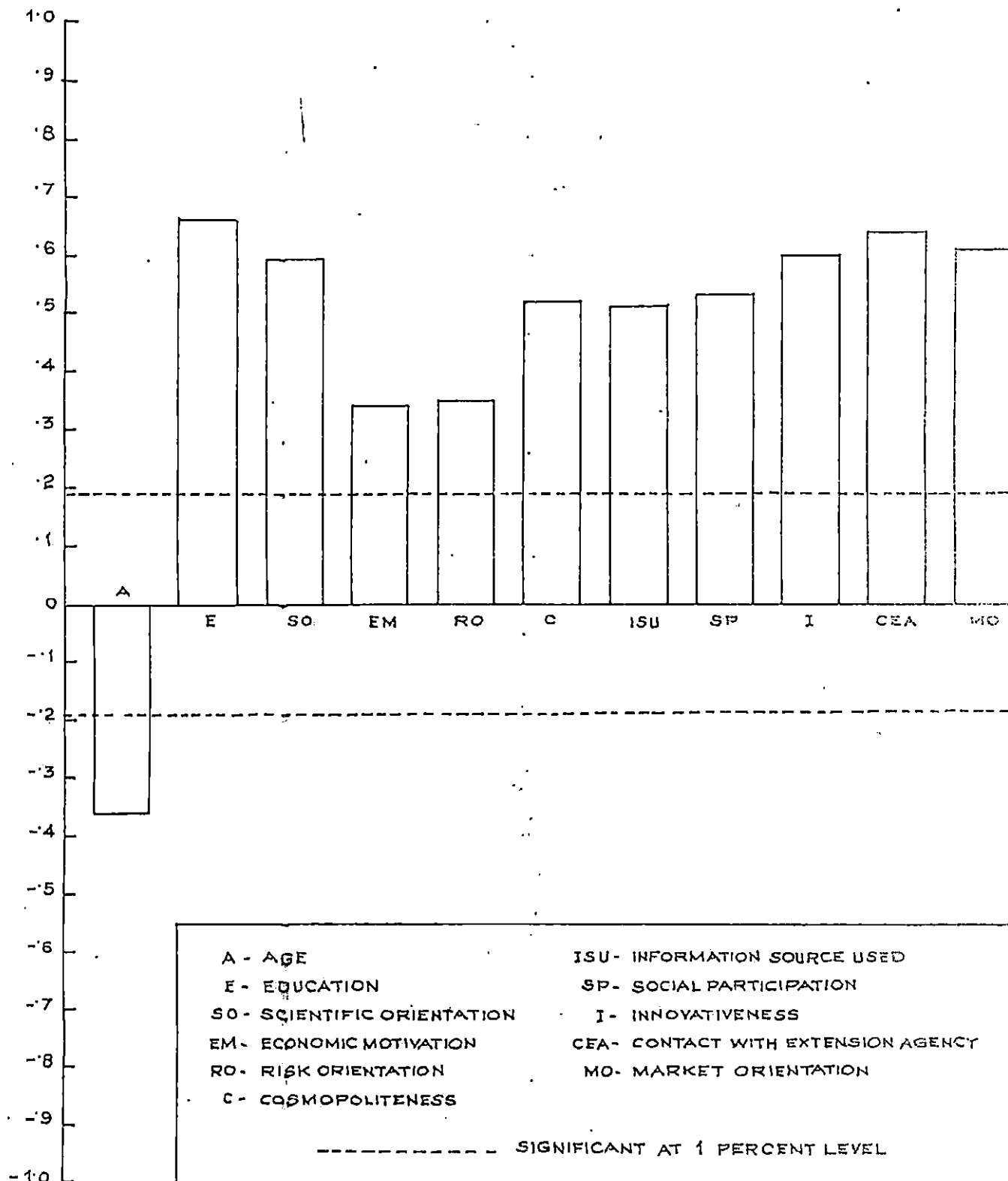
FIG.3. CORRELATION BETWEEN EXTENT OF AWARENESS OF IMPROVED
AGRICULTURAL PRACTICES AND THE INDEPENDENT VARIABLES.

Variable No.	Independent variables	Correlation Coefficient 'r'
X_8	Social participation	0.5281^{**}
X_9	Innovativeness	0.5983^{**}
X_{10}	Contact with extension agency	0.6358^{**}
X_{11}	Market orientation	0.5087^{**}

**Significant at 1 per cent level of probability.

From the Table 4.5, it can be seen that all the variables are positively and significantly correlated with awarness of improved agricultural practices in pepper at 1 per cent level of probability except the variable, age which is negatively and significantly correlated. Hence, it could be inferred that awareness is the function of the variables, namely, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency, market orientation and these variables could influence positively the dependent variable, namely, awareness.

4.5.2. Correlation between knowledge about improved agricultural practices in pepper and the independent variables.

The zero - order correlation of the knowledge about improved agricultural practices with the independent

variable is given in Table 4.6 and it is diagrammatically represented in Figure 4.

Table 4.6. Correlation between knowledge about improved agricultural practices in pepper and independent variables.

Variable No.	Independent variables	Correlation Coefficient 'r'
X_1	Age	-0.3886^{**}
X_2	Education	0.7093^{**}
X_3	Scientific orientation	0.6150^{**}
X_4	Economic motivation	0.3432^{**}
X_5	Risk orientation	0.4486^{**}
X_6	Cosmopoliteness	0.5014^{**}
X_7	Information source used	0.5015^{**}
X_8	Social participation	0.5769^{**}
X_9	Innovativeness	0.6725^{**}
X_{10}	Contact with extension agency	0.6657^{**}
X_{11}	Market orientation	0.4793^{**}

** Significant at 1 per cent level of probability.

The results given in Table 4.6 indicate that all the independent variables are positively and significantly correlated with knowledge of improved agricultural practices in pepper at 1 per cent level of probability except the variable age, which is negatively and significantly correlated with knowledge. Hence it could be inferred that knowledge is a function of the variables namely, education,
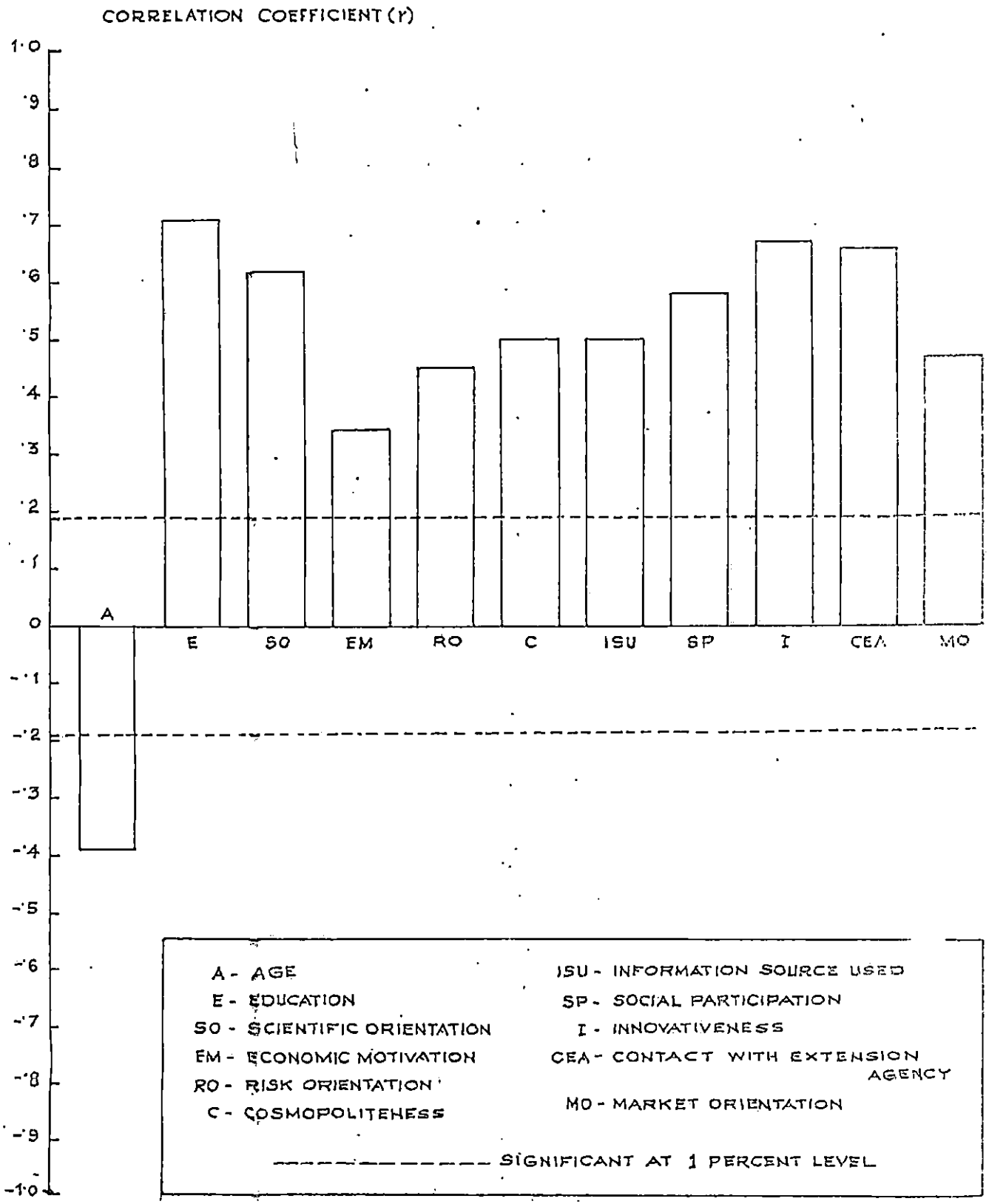
FIG. 4. CORRELATION BETWEEN KNOWLEDGE ABOUT IMPROVED AGRICULTURAL PRACTICES AND THE INDEPENDENT VARIABLES.

scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency, market orientation and could influence positively the dependent variable.

4.5.3. Correlation between attitude of pepper growers towards improved agricultural practices and the independent variables.

The zero - order correlation of the attitude of pepper growers towards improved agricultural practices in pepper with the independent variables are given in Table 4.7 and it is diagrammatically presented in Figure 5.

Table 4.7. Correlation between attitude of pepper growers towards improved agricultural practices and independent variables.

Variable No.	Independent variable	Correlation Coefficient 'r'
X_1	Age	-0.4338**
X_2	Education	0.6134**
X_3	Scientific orientation	0.6437**
X_4	Economic motivation	0.3067**
X_5	Risk orientation	0.5324**
X_6	Cosmopoliteness	0.4566**
X_7	Information source used	0.4054**
X_8	Social participation	0.4703**
X_9	Innovativeness	0.6175**
X_{10}	Contact with extension agency	0.5334**
X_{11}	Market orientation	0.5699**

** Significant at 1 per cent level of probability.

CORRELATION COEFFICIENT (r)

A —	AGE	ISU — INFORMATION SOURCE USED
E —	EDUCATION	SP — SOCIAL PARTICIPATION
SO —	SCIENTIFIC ORIENTATION	I — INNOVATIVENESS
EM —	ECONOMIC MOTIVATION.	CEA — CONTACT WITH EXTENSION AGENCY
RO —	RISK ORIENTATION	
C —	COSMOPOLITENESS	MO — MARKET ORIENTATION

- - - - - - - - - - SIGNIFICANT AT 1 PERCENT LEVEL
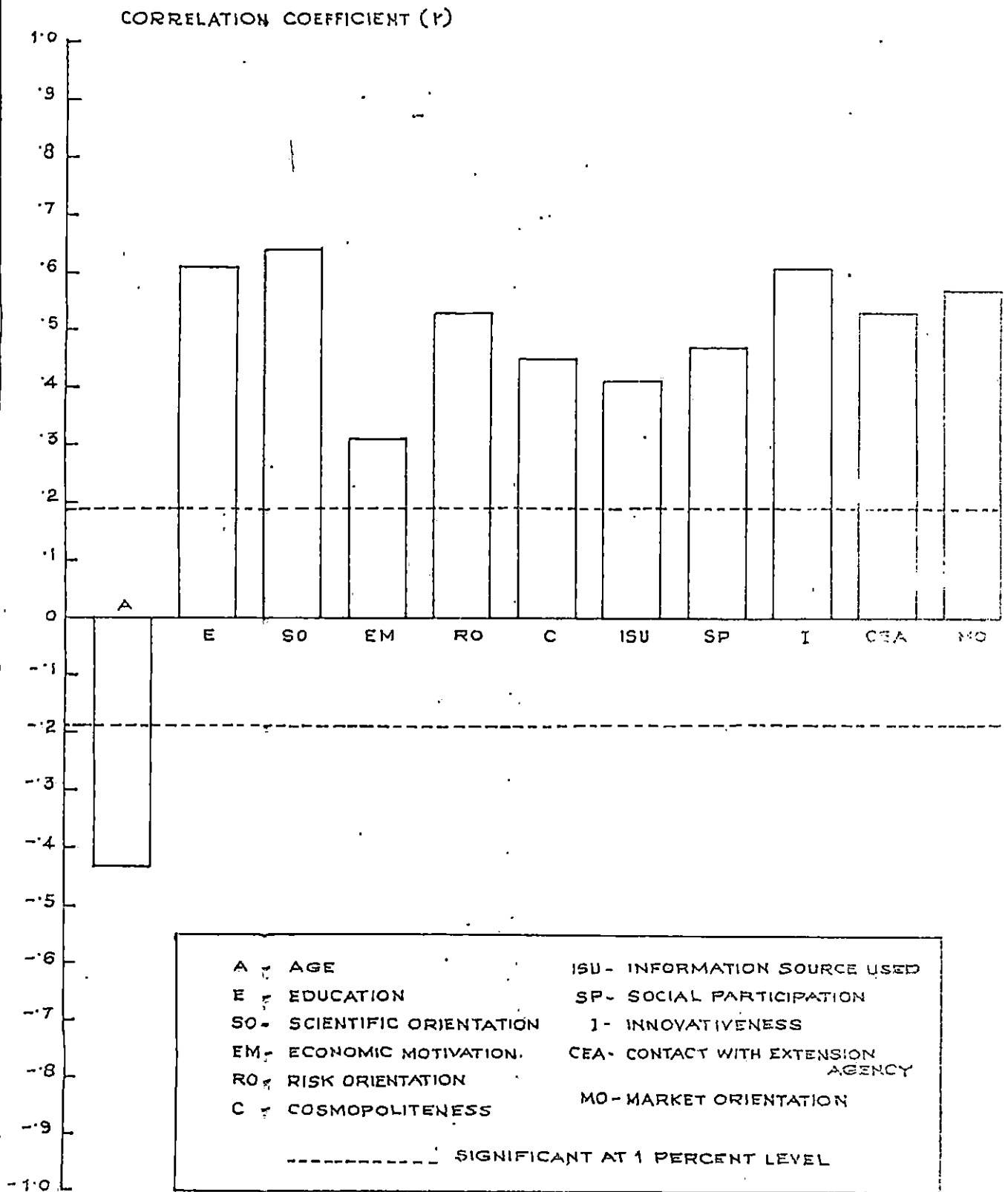
FIG. 5. CORRELATION BETWEEN ATTITUDE TOWARDS IMPROVED
AGRICULTURAL PRACTICES AND THE INDEPENDENT VARIABLES.

From the Table 4.7 it can be seen that all the independent variables are positively and significantly correlated with attitude of pepper growers towards improved agricultural practices in pepper at 1 per cent level of probability except the variable age, which is negatively and significantly correlated. Hence it could be inferred that attitude is a function of the variables, namely, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency, market orientation and could influence positively the dependent variable.

4.5.4. Correlation between extent of adoption of improved agricultural practices in pepper and independent variables.

The zero - order correlation of the extent of adoption of improved agricultural practices with the independent variables is presented in Table 4.8 and it is diagrammatically presented in Figure 6.

Table 4.8. Correlation between extent of adoption of improved agricultural practices in pepper and independent variables.

Variable No.	Independent variables	Correlation Coefficient 'r'
X_1	Age	-0.3704^{**}
X_2	Education	0.6468^{**}
X_3	Scientific orientation	0.5199^{**}
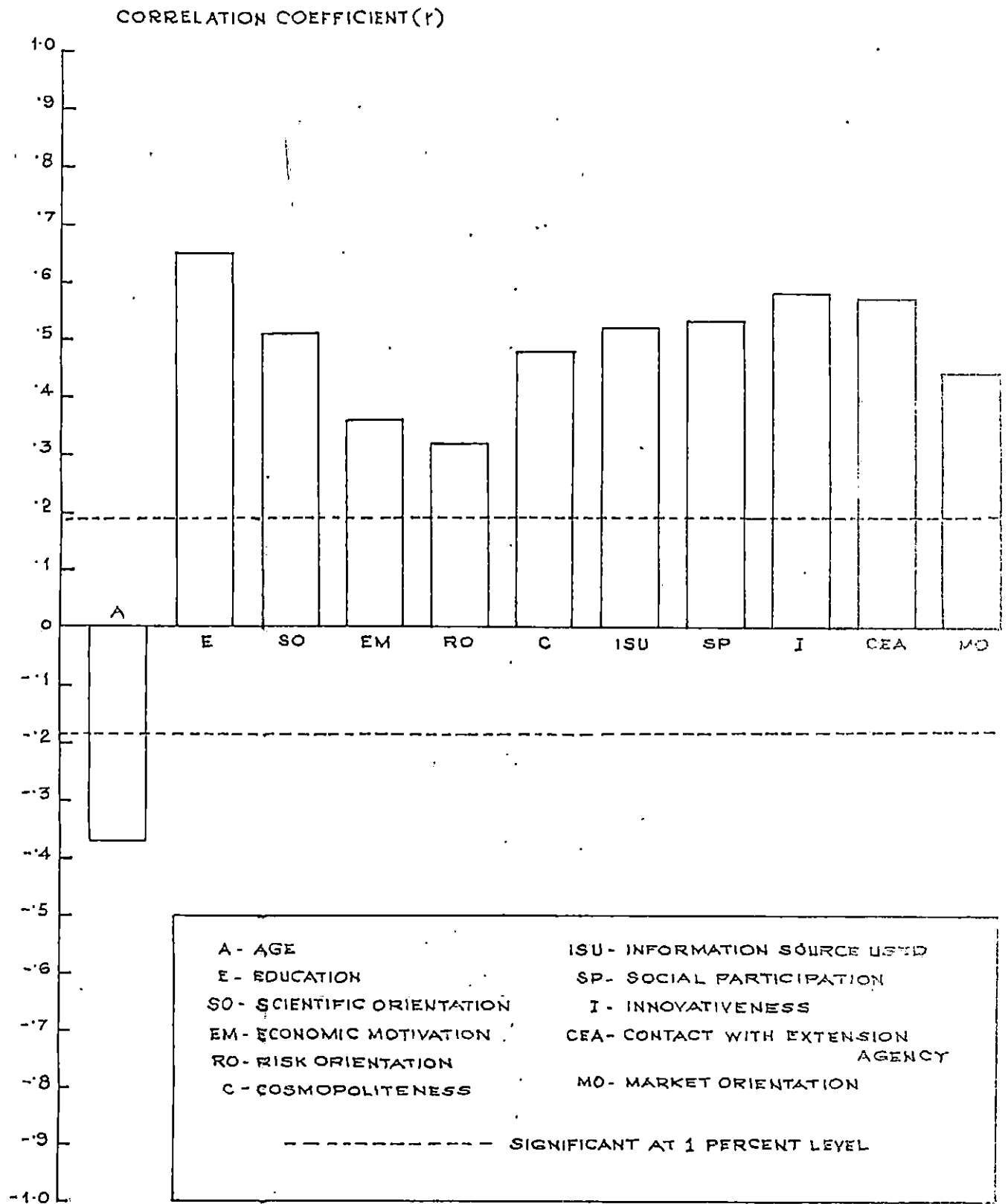
CORRELATION COEFFICIENT (r)

FIG. 6. CORRELATION BETWEEN EXTENT OF ADOPTION OF IMPROVED
AGRICULTURAL PRACTICES AND INDEPENDENT VARIABLES

A - AGE
E - EDUCATION
SO - SCIENTIFIC ORIENTATION
EM - ECONOMIC MOTIVATION
RO - RISK ORIENTATION
C - COSMOPOLITENESS

ISU - INFORMATION SOURCE USED
SP - SOCIAL PARTICIPATION
I - INNOVATIVENESS
CEA - CONTACT WITH EXTENSION
            AGENCY
MO - MARKET ORIENTATION

— — — — — — — SIGNIFICANT AT 1 PERCENT LEVEL

Variable No.	Independent variable	Correlation Coefficient 'r'
X_4	Economic motivation	0.3554^{**}
X_5	Risk orientation	0.3233^{**}
X_6	Cosmopoliteness	0.4787^{**}
X_7	Information source used	0.5181^{**}
X_8	Social participation	0.5290^{**}
X_9	Innovativeness	0.5787^{**}
X_{10}	Contact with extension agency	0.5714^{**}
X_{11}	Market orientation	0.4433^{**}

** Significant at 1 per cent level of probability.

From the Table 4.8 it can be seen that all the independent variables except age, is positively and significantly correlated with adoption of improved agricultural practices in pepper at 1 per cent level of probability. Age is negatively and significantly correlated with adoption. Hence it could be inferred that adoption of improved agricultural practices in pepper is a function of the variables, namely, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency, market orientation and could influence positively the dependent variable.

4.6. <u>Relative importance of the selected socio-psychological and economic characteristic in contributing to the awareness, knowledge, attitude and adoption of improved agricultural practices in pepper.</u>

Simple correlation was useful only to find the relationship between the dependent and independent variables. A multivariate approach was attempted to explain the relationship of the independent variables(x_i)taken together on dependent variable (Y). The step-wise regression analysis was performed to find out the best fitting regression relationship of Y_i with x_is'and the results are presented below:

4.6.1. Step-wise multiple regression analysis of the extent of wareness of improved agricultural practices with the independent variables.

The result of the regression analysis has been presented in Table 4.9 and 4.10.

Table 4.9 Step-wise regression analysis of awareness on independent variables.

Step Number	Variable included in the regression analysis	F- value	% variation explained
1	X_2	152.55	43.52
2.	X_2 X_{11}	115.34	53.94
3	X_2 X_{11} X_4	91.98	58.47
4	X_2 X_{11} X_4 X_9	77.22	61.30
5	X_2 X_{11} X_4 X_9 X_{12}	66.99	63.35
6	X_2 X_{11} X_4 X_9 X_{12} X_8	59.32	64.84
7.	X_2 X_{11} X_4 X_9 X_{12} X_8 X_{10}	51.98	65.46

Table 4.10 Step-wise regression b- coefficient of awarness on independent variables.

Variable No.	Name of indepdent variable	Decoded b-coeffi-cient.	S.E.of 'b'	Partial F-test
X_2	Education	0.182^{**}	0.056	10.563^{**}
X_{11}	Contact with exten-sion agency.	0.199^{**}	0.059	11.376^{**}
X_4	Scientific orien-tation.	0.048^{**}	0.014	11.755^{**}
X_9	Social partici-pation.	0.389^{**}	0.128	9.236^{**}
X_{12}	Market orienta-tion.	0.091^{**}	0.031	9.201^{**}
X_8	Information source used.	0.057^{**}	0.021	7.367^{**}
X_{10}	Innovativeness	0.058^{**}	0.031	3.501^{**}

Constant term in the predicted equation = -1.790
** Significant at 0.01 per cent level.

From Table 4.9 it can be observed that education (X_2) is the most important variable in explaning the variation in the extent of awareness of improved agricultural practices in pepper, as more than 43 per cent of the variation could be explained by this single variable. A perusal of the table reveals that the predictive power of the regression equation increased with each additional step. Step number seven which included seven variables gave the maximum R^2 value (65.46) with an F-value of 51.98 which indicated that the predictive power

was highest at this step. More than 65 per cent variation was explained by all these seven variables X_2, X_{11}, X_4, X_9, X_{12}, X_8 amd X_{10} (Figure 7). The regression coefficient of all the seven variables was significant at 1 per cent level.

The regression equation given below is significant in predicting the awareness of improved agricultural practices in pepper.

$$Y = -1.790 + 0.058^{**}X_{10} + 0.057^{**}X_8 + 0.091^{**}X_{12} + 0.389^{**}X_9 + 0.048^{**}X_4 + 0.199^{**}X_{11} + 0.182^{**}X_2$$

From the above regression equation it is evident that more than 65 per cent variation in awareness of improved agricultural pratices in pepper was explained by education (x_2); contact with extension agency (X_{11}), Scientific orientation (x_4), Social participation (x_9), Market orientation (x_{12}), Information source used (x_8) and innovativeness (x_{10})

4.6.2. Step-wise multiple regression analysis of the extent of knowledge about improved agricultural practices in pepper with the independent variables.

The result of the regression analysis has been presented in Table 4.11 and 4.12.

EDUCATION   43·53%

+ CONTACT WITH EXTENSION AGENCY 53·94%

+ SCIENTIFIC ORIENTATION   58·47%

+ SOCIAL PARTICIPATION   61·30%

+ MARKET ORIENTATION   63·35%

+ INFORMATION SOURCE USED 64·84%

+ INNOVATIVENESS 65·46%
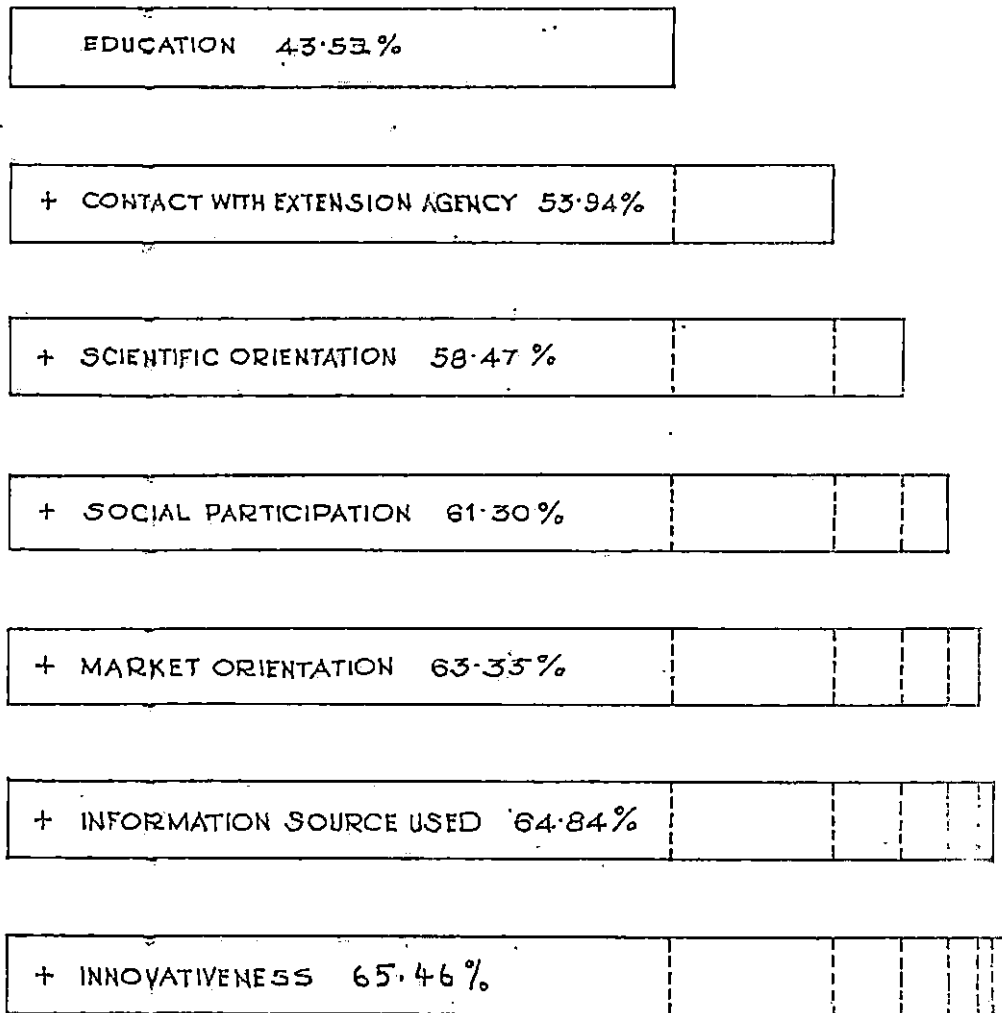
FIG. 7. RELATIVE CONTRIBUTION OF THE SEVEN SELECTED INDEPENDENT
        VARIABLES TO THE DEPENDENT VARIABLE AWARENESS.

Table 4.11. Step-wise regression analysis of knowledge on
          independent variables.

Step No.	Variables included in the regression analysis	F- Value	Per cent variation explained
1.	X_2	200.42	50.30
2.	X_2 X_{11}	153.41	60.89
3.	X_2 $X_{11}X_{10}$	126.62	65.97
4.	X_2 X_{11} X_{10} X_9	112.56	69.78
5.	X_2 X_{11} X_{10} X_9 X_4	101.59	72.36
6.	X_2 X_{11} X_{10} X_9 X_4 X_6	86.37	72.86
7.	X_2 X_{11} X_{10} X_9 X_4 X_6 X_8	75.36	73.31
8.	X_2 X_{11} X_{10} X_9 X_4 X_6 X_8 X_{12}	66.50	73.58

Table 4.12. Step-wise regression b-coefficients of knowledge on
          independent variables.

Variable No.	Name of independent variable	De coded b-co-efficient	S.E.of 'b'	Partial F-test
X_2	Education	0.233^{**}	0.059	15.59^{**}
X_{11}	Contact with extension agency.	0.246^{**}	0.062	15.74^{**}
X_{10}	Innovativeness	0.129^{**}	0.033	15.28^{**}
X_9	Social participation	0.041^{**}	0.136	0.09^{**}

Variable No.	Name of independent variable	De coded b-co-effi-cient	S.E.of 'b'	Partial F-test
X_4	Scientific orientation	0.050^{**}	0.016	9.77^{**}
X_6	Risk orientation	0.051^{**}	0.027	3.57^{**}
X_8	Inforfmation source used	0.041^{**}	0.022	3.47^{**}
X_{12}	Market orientation	0.045^{**}	0.032	1.98^{**}

Constant term in the predicted equation = -1.453

** Significant at 0.01 per cent level

From the table 4.11 it can be observed that education (X_2) is the most important variable in explaining the variation in the extent of knowledge about improved agricultural practices in pepper. More than 50 per cent of variation could be explained by this single variable. A perusal of the table reveals that the predictive power of the regression equation increased with each additional step. Step number eight which included eight variables gave the maximum R^2 value (73.54) with an F value of 65.50 which indicated that the predictive power was highest at this step. More than 73.5 per cent variation was explained by all these eight variables (Figure 8). The regression co-efficients of all these eight variables was significant at 1 per cent level.

EDUCATION 50·30 %

+ CONTACT WITH EXTENSION AGENCY 60·89 %

+ INNOVATIVENESS 65·97 %

+ SOCIAL PARTICIPATION 69·73 %

+ SCIENTIFIC ORIENTATION 72·56%

+ RISK ORIENTATION 72·86%

+ INFORMATION SOURCE USED 73·31 %

+ MARKET ORIENTATION 73·58 %

FIG. 8. RELATIVE CONTRIBUTION OF THE EIGHT SELECTED INDEPEND
VARIABLES TO THE DEPENDENT VARIABLE KNOWLEDGE.

The regression equation given below is significant in predicting the knowledge (about improved agricultural practices in pepper.

$$Y = -1.453 + 0.045^{**}X12 + 0.041^{**}X_8 + 0.051^{**}X_6 + 0.050^{**}X_4 + 0.041^{**}X_9 + 0.129^{**}X_{10} + 0.248^{**}X_{11} + 0.233^{**}X_2$$

From the above regression equation it is evident that 73.58 per cent of variation in the knowledge about improved agricultural practices in pepper was explained by education (X_2), contact with extension agency (X_{11}), Innovativeness (X_{10}), Social participation (X_9), Scientific orientation (X_4), Risk orientation (X_6), Information source used (X_8) and Market orientation (X_{12}).

4.6.3. Step-wise multiple regression analysis of the attitude of pepper growers towards improved agricultural practices in pepper with the independent variables.

The results of regression analysis has been presented in table 4.13 and 4.14.

From the table 4.13 it can be observed that scientific orientation is the most important variable in explaining the variation in the attitude of pepper growers towards imroved agricultural practices in pepper. More than 41 per cent of the variation could be explained by this single variable. A perusal of the table reveals that predictive power of the regression equation increased with each addition step. Step number seven which included seven variables gave the maximum R^2 value (67.39) with an F-value of 56.68 which indicated that the predictive power was highest at this step. More than 67 per cent of the variation was explained by all these seven variables (Figure 9). The regression coefficient of all the seven variables was significant at 1 per cent level.
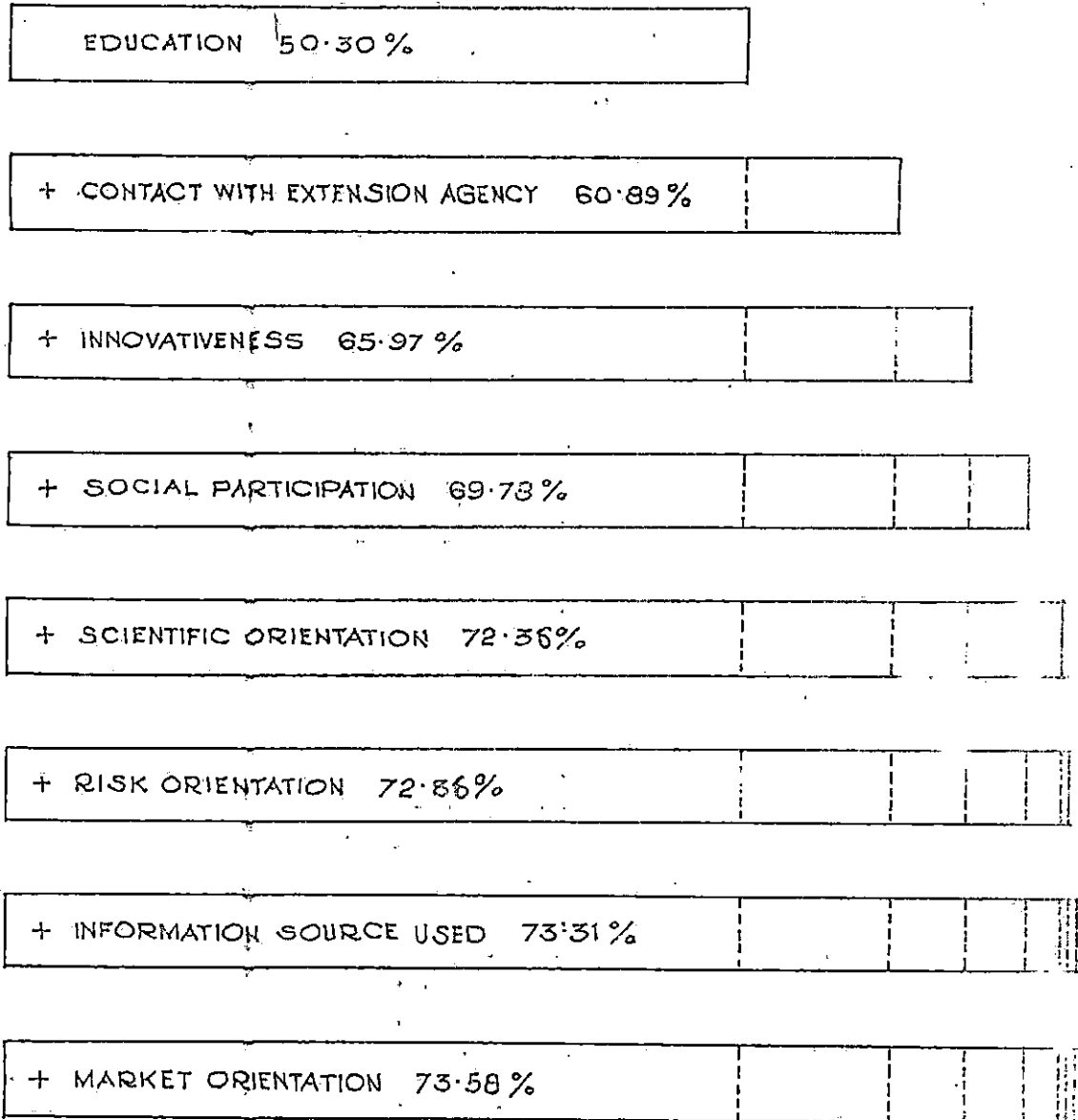
The regression equation given below is significant in predicting the attitude towards improved agricultural practices in pepper.

$$Y = 0.423 + -0.005 X_1 + 0.100^{**} X_9 + 0.038^{**} X_{10} + 0.041^{**} X_6$$
$$+ 0.045^{**} X_2 + 0.054^{**} X_{12} + 0.023^{**} X_4$$
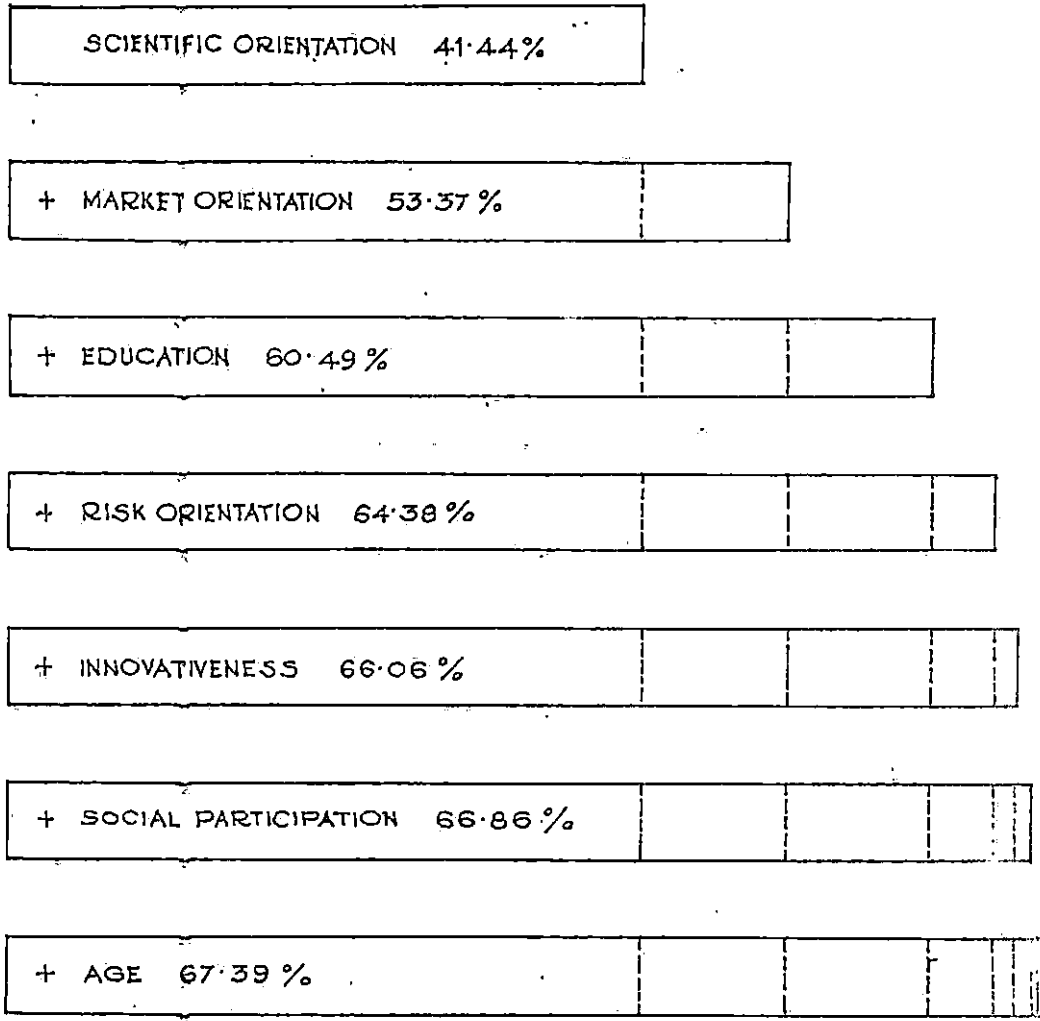
FIG. 9. RELATIVE CONTRIBUTION OF THE SEVEN SELECTED INDEPENDENT VARIABLES TO THE DEPENDENT VARIABLE ATTITUDE.

From the above regression equation it is evident that more than 67 per cent of variation in attitude towards improved agricultural practices in pepper was explained by Scientific orientation (X_4) , Social participation (X_9), Innovativeness (X_{10}), Risk orientation (X_6), education (X_2), Market orientation (X_{12}) and Age(X_1).

4.6.4 Step-wise multiple regression analysis of extent of adoption of improved agricultural practices in pepper with independent variables.

The results of the regression analysis has been presented in Table 4.15 and 4.16.

Table 4.15. Step-wise regression analysis of adoption on independent variables.

Step No.	Variables included in the regression analysis	F-Value	% variation explained
1.	X_2	142.40	41.83
2.	X_2 X_{11}	91.95	48.48
3.	X_2 X_{11} X_9	71.52	52.26
4.	X X_{11} X_9 X_8	59.68	55.04
5.	X X_{11} X_9 X_8 X_{10}	52.13	57.33
6.	X_2 X_{11} X_9 X_8 X_{10} X_4	45.14	58.39
7.	X_2 X_{11} X_9 X_8 X_{10} X_4 X_{12}	39.72	59.15

Table 4.16 . Step-wise regression 'b-coefficients of adoption on independent variables.

Variable number	Name of independent variable	De-coded 'b' co-effi-cient.	S.E.of 'b'	Partial F-test
X_2	Education	2.278**	0.672	11.49**
X_{11}	Contact with extension agency	1.364**	0.702	3.78**
X_9	Social participation	4.890**	1.531	10.201**
X_8	Information source used	0.806**	0.245	10.82**
X_{10}	Innovativeness	0.851**	0.375	5.15**
X_4	Scientific orientation	0.329**	0.172	3.66**
X_{12}	Market orientation	0.684**	0.363	3.55**

Constant term in the regression equation = -25.931

** Signification at 0.01 per cent level

From the table 4.15 it can be observed that education (X_2) is the most important variable in explaining the variation in the extent of adoption of improved agricultural practices, as more than 41 per cent of the variation could be explained by the single variable . A perusal of the table reveals that the predective power of regression equation increased with each additional step. Step number seven which included seven variables gave the maximum R^2 value (59.43) with an F-value 39.72 which indicated that the predictive power was

highest ⎛⎯⎯⎯⎞ at this step. More than 59 per cent of variation was explained by all these seven variables (Figure-10)

The regression coefficients of all the seven variables was significant at 1 per cent level.

The regression equation given below is significant in predicting the adoption of improved agricultural practices in pepper.

$$Y = -25.931 + 0.684^{**}X_{12} + 0.329^{**}X_4 + 0.851^{**}X_{10} + 0.806^{**}X_8$$
$$+4.890^{*}X_9 + 1.364^{**}X_{11} + 2.278^{**}X_2$$

From the above regression equation it is evident that 59 per cent of the variation in adoption of improved agricultural practices in pepper was explained by education (X_2), contact with extension agency (X_{11}), Social participation (X_9), Information source used (X_8), Innovativeness (X_{10}) scientific orientation (X_4) and market orientation (X_{12}).

4.7. Constraints in the adoption of improved agricultural practices in pepper as perceived by pepper growers and their solutions.

The pepper farmers were interviewed with an open ended questionnaire to state the problems in their order of importance, which they faced in adopting the improved agricultural practices. These constraints were ranked on the importance based on their perception. It was found that the most important constraint experienced by pepper growers was the extensive prevalence of pests and diseases.

EDUCATION   43·83 %

+ CONTACT WITH EXTENSION AGENCY   48·48%

+ SOCIAL PARTICIPATION   52·26 %

+ INFORMATION SOURCE USED   55·04 %

+ INNOVATIVENESS   57·33 %

+ SCIENTIFIC ORIENTATION   58·39 %

+ MARKET ORIENTATION   59·15 %
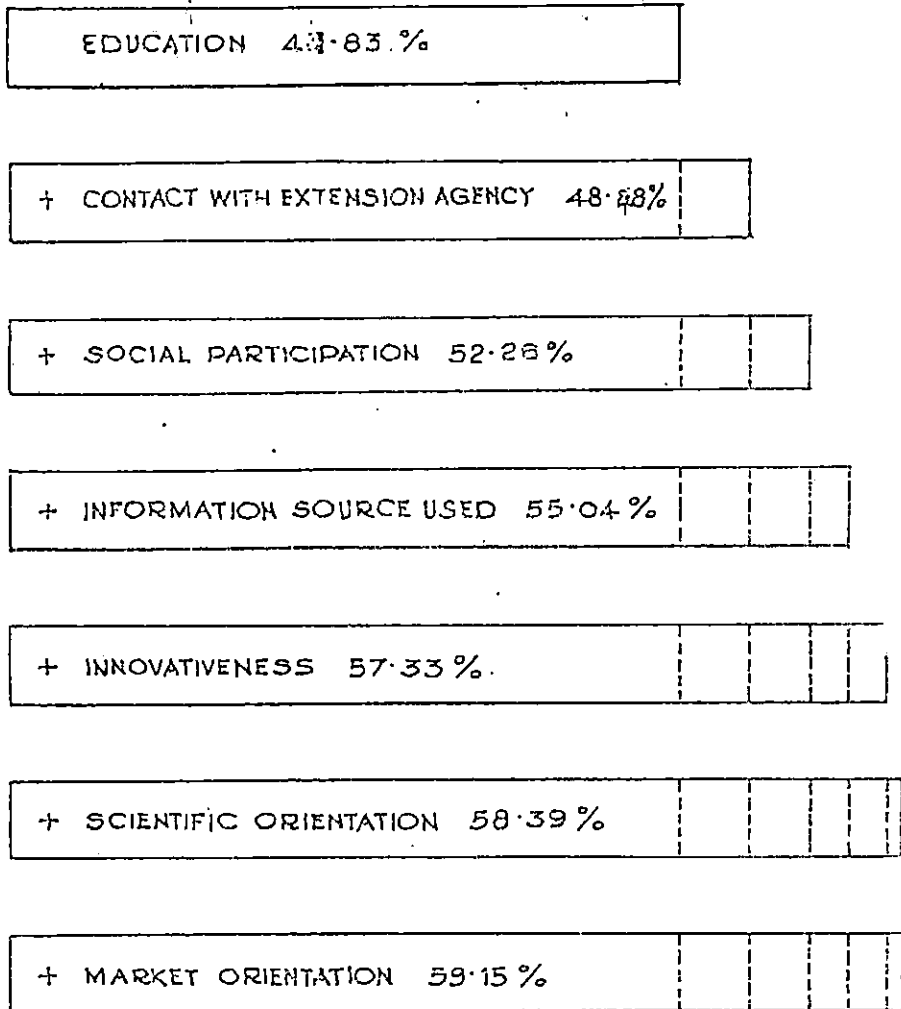
FIG. 10. RELATIVE CONTRIBUTION OF THE SEVEN SELECTED
          INDEPENDENT VARIABLES TO THE DEPENDENT VARIABLE
          ADOPTION.

The constraints next in importance were the high cost of production inputs, Lack of awareness of improved agricultural practices in pepper, traditional systems of cultivation, inadequate extension supports, lack of sufficient good quality planting materials, inadequate research support, long duration rainless period, fluctuating price of black pepper, non-availability of literature on improved agricultural practices, non-availability of input materials and small and marginal size of holdings in that order.

Table 4.17. Constraints in the adoption of improved agricultural practices in pepper as perceived by pepper growers.

Sl. No.	Constraints	Cumulative Index Frequency of response	Rank
1.	Lack of sufficient good quality planting materials.	2.04	VI
2.	High cost of production inputs	2.59	II
3.	Inadequate extension support	2.05	V
4.	Small and marginal size of holdings.	1.23	XII
5.	Traditional systems of cultivation.	2.16	IV
6.	Extensive prevalence of pests and diseases.	2.75	I
7.	Lack of awareness of improved agricultural practices in pepper.	2.30	III
8.	Non-availability of input materials.	1.29	XI
9.	Inadequate research support	1.44	VII
10.	Non-availability of literature on improved agricultural practices.	1.31	X

Sl. No.	Constraints	Cumulative Index	
		Frequency of response	Rank
11.	Long duration of rainless period	1.35	VIII
12.	Fluctuating price of black pepper.	1.32	IX

In order to overcome the above constraints the following solutions have been suggested by the farmers which need urgent attention and care by the research and development agencies.

Table 4.18 Solutions to overcome the constraints in the adoption of improved agricultural practices in pepper as perceived by pepper growers.

Sl. No.	solutions	No. of farmers who suggested	Percent-age.
1.	Develop disease tolerant varities.	68	24
2.	Production and distribution of good quality planting materials.	98	49
3.	Supply of newer high yielding varieties.	86	43
4.	Develop low cost technologies for the control of pests and diseases.	112	56
5.	Implement soil and water conservation programmes with adequate technical assistance.	90	45
6.	Ensure proper marketing network coupled with remunerative price for black pepper.	82	41
7.	Provide adequate training to farmers about improved agricultural practices.	54	27
8.	Develop drought tolerant varieties.	84	42

DISCUSSION

C H A P T E R - V

DISCUSSION

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

1. Extent of awareness of improved agricultural practices in pepper by pepper growers.

2. Extent of knowledge about improved agricultural practices in pepper by pepper growers.

3. Attitude of pepper growers towards improved agricultural practices in pepper.

4. Extent of adoption of improved agricultural practices in pepper by pepper growers.

5. Relationship of selected socio-psychological and economic characteristics of pepper growers with their awareness, knowledge, attitude and adoption of improved agricultural practices in pepper.

6. Constraints in the adoption of improved agricultural practices in pepper by pepper growers and their suggestions to overcome the constraints.

5.1.   Extent of awareness of improved agricultural
        practices in pepper by pepper growers.

The results given in Table 4.1 revealed that majority
of pepper growers in the study area had medium level of
awareness of improved agricultural practices in pepper.

The medium level of awareness might be due to the
contact with various extension agency and participation in
extention activities by the pepper growers.   The modern
information sources namely, radio, T.V., Newspaper and other
agricultural publications, and interpersonal contacts where
interaction between farmers in exchanging ideas on new
agricultural practices also might have played an important
role in influencing the farmers' awareness of improved
agricultural practices in pepper.

5.2   Extent of knowledge about improved agricultural
       practices in pepper by pepper growers.

The results given in Table 4.2 revealed that majority
of the pepper growers in the study area had medium level of
knowledge about improved agricultural practices in pepper.

The modern communication techniques available might
have helped the pepper growers to know more about improved
agricultural practices in pepper.   The contact with

extension agencies and other farmers might have broadened their knowledge about improved cultivation practices. Education level of pepper growers is an important factor which affects the knowledge level. Educated farmers are likely to make a better use of mass media channel and acquire information about improved agricultural practices. Pepper is cultivated as a monocrop in most part of the study area, which enables them to concentrate more in this crop and indirectly force them to acquire better knowledge about improved agricultural practices in pepper.

5.3 Attitude of pepper growers towards improved agricultural practices in pepper.

The results given in Table 4.3 revealed that majority of pepper growers in the study area had medium level of attitude towards improved agricultural practices in pepper.

The medium level of attitude might be due to the contact with extension agencies and the participation in extension programmes which would increase the level of knowledge and develop a favourable attitude towards improved agricultural practices. The Special Agricultural Development Units (SADU), Training and Visit Programmes, Group Management Programmes in pepper and various spices development programmes might have influenced the pepper

growers and motivated them to develop a favourable attitude. The crop improvement loans given by the development agencies might have also influenced their attitude.

5.4.   Extent of adoption of improved agricultural
         practices in pepper by pepper growers.

The results given in Table 4.4 revealed that majority of pepper growers in the study area were medium adopters of improved agricultural practices in pepper.

The medium level of adoption of improved agricultural practices in pepper by majority of pepper growers is a clear indication of change from the traditional system of pepper cultivation to the new scientific system. The use of mass media and other information sources might have contributed to increase the knowledge level of farmers and a favourable attitude change, which might have lead to adoption of improved agricultural practices. The contact with extension agencies and other farmers also might have broadened their knowledge about improved agricultural practices leading to adoption. The participation of farmers in various organisations might have helped the farmers to obtain supply and service facilities necessary to put the acquired ideas into practice. This acquisition of knowledge and physical input might have lead to better adoption. The extension and development programmes namely farmers training, crop

improvement- loans etc. implemented in the area to improve the pepper production might have motivated the pepper growers to adopt improved agricultural practices in pepper.

5.5. Relationship of the selected socio psychological and economic characteristics of pepper growers with their awareness, knowledge, attitude and adoption of improved agricultural practices in pepper.

5.5.1 Relationship between selected independent variables and extent of awareness of improved agricultural practices in pepper.

All the independent variables except age was found to be positively and significantly related with awareness of improved agriultural practices in pepper. Age was found to have significant negative relationship with awareness. So, the hypothesis set for the study that there will be no significant relationship between independent variables and awareness was rejected in the case of age, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency and market orientation.

The relationship of each characteristic on the awareness of improved agricultural practices in pepper is separately discussed below.

Age was found to have negative and significant relationship with awareness of improved agricultural practices in pepper. This might be due to the fact that as the farmers become old, they loose their interest to acquire new information about latest technology. It is quite often seen that young farmers show a higher degree of interest and enthusiasm to know and understand technological development in the field of agriculture than the old farmers. This finding is in conformity with the study reported by Nandakumar (1980) Cherian (1984) and Sajeevchandran (1989).

Educational level was found to have a positive and significant relationship with awareness of improved agricultural practices in pepper. This might be due to the reason that educated farmers are likely to make a better use of mass media channels and other information sources to acquire information on improved agricultural practices. This finding is in agreement with the findings of Vijayaraghavan (1979), Balu (1980), Mani (1980), Nandakumar (1980), Haraprasad (1982) and Sajeevchandran (1989).

Scientific orientation was found to have significant and positive relationship with awareness of improved agricultural practices in pepper. Scientifically oriented farmers would have more eagerness to know about the new innovations. That eagerness might have forced them to contact extension personnel more frequently and acquire informations from various sources, which in turn might have enhanced their awareness about improved agricultural practices in pepper. This might be the reason for the positive and significant relationship of scientific orientation and awareness. This finding is in agreement with the findings of Nandakumar (1980), Aristotle (1981) and Sajeevchandran (1989).

The positive and significant relationship of economic motivation and awareness of improved agricultural practices might be due to the fact that the pepper growers who are oriented towards achievement of the maximum profit from pepper cultivation might have acquired more informations about the improved agricultural practices. This finding is in agreement with the findings of Nandakumar (1980), Aristotle(1981) and Sajeevchandran (1989).

Risk orientation was found to have significantly and positively associated with awareness of improved agricultural practices in pepper. This might be attributed to the fact that a farmer who is willing to take risk is sure to enter into a new experience in his farming life. This experience might have resulted in increasing his awareness of improved agricultural practices. This result is in conformity with the findings of Nandakumar (1980), Aristotle (1981), Cherian (1984) and Sajeevchandran (1989).

Cosmopoliteness was found to have significant and positive relationship with awareness of improved agricultural practices in pepper. With the increase in the number of outside contacts, the farmers get more oriented towards improved agricultural practices. This may be due to the fact that the farmers who interact with other farmers during their visits to nearest town or city receives more information from them.

Information source used was found to have significant and positive relationship with awareness of improved agricultural practices in pepper. This might be due to utilisation of various information source which makes the farmer aware of the latest information on the improved agricultural practices. This finding is in agreement with the findings of Naik (1981), Cherian (1984) and Sajeevchandran (1989).

The positive and significant relationship of social participation with awareness of improved agricultural practices in pepper might be due to the fact that farmers by virtue of their participation in different organizations might have gained information on improved agricultural practices due to their interaction with other well-informed farmers. This finding is in agreement with the findings of Haraprasad (1982).

Innovativeness was found to have significant and positive relationship with awareness of improved agricultural practices in pepper. This might be due to the fact that innovative farmers are likely to derive more information regarding various improved agricultural practices from different sources. This finding is in agreement with the findings of Sajeevchandran (1989).

Contact with extension agency was found to have significant and positive relationship with awareness of improved agricultural practices. This might be due to the reason that farmers having frequent contact with extension agencies and participation in extension activities get motivated themselves to gain more awareness of improved agricultural practices. This finding is in conformity with the findings of Haraprasad (1982).

Market orientation was found to have significant and positive relationship with awareness of improved agricultural practices. This might be due to the fact that pepper growers oriented towards the market in terms of demand and price of the produce might have naturally acquired more information on improved agricultural practices in pepper. This result is in conformity with the findings of Sajeevchandran (1989).

5.5.2 Relationship between the selected independent variables and extent of knowledge about improved agricultural practices in pepper.

All the independent variables except age were found to be positively and significantly related to knowledge of improved agricultural practices. Age was found to be negatively and significantly related to knowledge. So the hypothesis set for the study that there will be no significant relationship between independent variables and knowledge was rejected in the case of age, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency and market orientation.

The relationship of each characteristic on the knowledge of improved agricultural practices in pepper is separately discussed below.

Age was found to have negative and significant relationship with knowledge of improved agricultural pratices in pepper. This might be due to the fact that young pepper farmers were comparatively more educated and having interest to acquire scientific information. They show a higher degree of interest and enthusiasm to know and understand improved cultivation practices than old farmers. This result is in conformity with the findings of Thampan (1990).

Education was found to have significant and positive relationship with knowledge of improved agricultural practices in pepper. The educated farmer having an access to information sources acquires scientific information in pepper cultivation. He may have greater contact with extension agencies and other farmers which might have increased his knowledge level. This finding is in agreement with the findings of Supe and Salode (1975), Kaleel (1978), Ahamed (1981), Haraprasad (1982), Balachandran (1983), Vijayakumar (1983), Viju (1985) and Thampan (1990).

The positive and significant relationship of scientific orientation with knowledge of improved agricultural practices in pepper might be due to the fact that scientifically oriented farmers would have more eagerness to know about the improved practices in pepper cultivation. They might have utilized different information source to acquire knowledge about improved agricultural practices. This result is in conformity with the findings of Supe and Salode (1975).

Economic motivation was found to have significant and positive relationship with knowledge of improved agricultural practices in pepper. The farmer seeking more monetary gains from pepper cultivation is likely to acquire more knowledge about improved agricultural practices in pepper. This might be the reason for the positive and significant relationship of economic motivation with knowledge. This result is in conformity with the findings of Somasundaram (1976).

Risk orientation was found to have significant and positive relationship with knowledge of improved agricultural practices in pepper. This might be attributed to the fact that a farmer who is willing to take risk is

sure to enter into improved agricultural practices. This might result in increasing the knowledge about improved agricultural practices. This result is in conformity with the findings of Viju (1985).

Cosmopoliteness was found to have significant and positive relationship with the knowledge of improved agricultural practices in pepper. This is in conformity with the findings of Knight and Singh (1975), Kamarudeen (1981) and Viju (1985). The significant and positive association between cosmopoliteness and extent of knowledge might be due to the fact that pepper growers who interact with other people during their visits to nearest town/city receive more cues from them; that add to their knowledge and as a result their knowledge level increases.

Information source used was found to have significant and positive relationship with knowledge about improved agricultural practices in pepper. This might be due to the fact that the use of different information sources help them to acquire more knowledge about improved agricultural practices. This finding is in agreement with the findings of Menon and Prema (1976), Prasad (1978) and Sheela (1989).

Social paricipation was found to have significant and positive relationship with the extent of knowledge about improved agricultural practices in pepper. It could be inferred that the result of social participation, the pepper growers might have established more contact with other people which might result in improving their knowledge level. This finding is in agreement with the findings of Kaleel (1978), Haraprasad (1982) and Thampan (1990).

Innovativeness was found to have significant and positive relationship with knowledge about improved agricultural practices in pepper. Innovative pepper growers are likely to derive more knowledge on improved agricultural practices from different sources which might be the reason for significant relationship of innovativeness with knowledge.

Contact with extension agency was found to have significant and positive relationship with knowledge about improved agricultural practices in pepper. This might be due to the reason that pepper growers having frequent contact with extension agencies are likely to acquire more knowledge about improved agricultural practices in pepper. This result is in conformity with the findings of Knight and Singh (1975) and Kaleel (1978).

It was found that market orientation had significant and positive relationship with knowledge of improved agricultural practices in pepper. This might be due to the fact that a pepper grower having information about the market of his produce can adjust the investment of money according to the demand of his produce. If the produce will get a reasonable price, farmers will try to acquire more knowledge about improved cultivation practices. This finding is in agreement with the findings of Sajeevchandran (1989).

5.5.3. Relationship between selected independent variables and attitude of pepper growers towards improved agricultural practices in pepper.

All the independent variables except age was found to be positively and significantly related with attitude of pepper growers towards improved agricultural practices in pepper. Age was found to be significantly and negatively related with attitude. So, the hypothesis set for the study that there will be no significant relationship between independent variables and attitude of pepper growers towards improved agricultural practices in pepper was rejected in the case of age, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency and market orientation.

Age was found to have negative and significant relationship with attitude of pepper growers towards improved agricultural practices in pepper. It is quite often seen that young farmers show a high degree of interest and enthusiasm to acquire more knowledge about improved agricultural practices. As attitude is related to knowledge, the young farmers might have developed favourable attitude towards improved agricultural practices in pepper. This finding is in agreement with the findings of Ravichandran (1980) and Sajeevchandran (1989).

The educational status was found to have significant and positive relationship with attitude of pepper growers towards improved agricultural practices in pepper. similar results have been reported by Ravichandran (1980),Subburaj (1980), Kamarudeen (1981), Cherian (1984) and Sajeevchandran (1989).

It could be inferred that the significant and positive relationship between educational status and attitude of pepper growers towards improved agricultural praactices is due to the result of acquiring more knowledge through education which influenced the favourable attitude towards improved agricultural practices in pepper.

Scientific orientation was found to have significant and positive relationship with the attitude of pepper

growers towards improved agricultural practices in pepper. It is often seen that educated, scientific-based people show a tendency to assess the new practices critically. The critical assessment of each of the practice would have convinced them to develop favourable attitude. This might be the reason for the positive and significant attitude. This finding is in agreement with the findings of Kamarudeen (1981), Cherian (1984) and Sajeevchandran (1989).

Economic motivation was found to have significant and positive relationship with attitude of pepper growers towards improved agricultural practices in pepper. This finding is in conformity with the findings of Das and Sarkar(1970), Somasundaram (1976) and Sajeevchandran (1989). A farmer seeking more monetary gains is likely to invest more money for production inputs. Once money is invested wisely and high yields are obtained, the farmer is likely to develop a positive attitude towards innovativeness. This might be the reason for the positive association of economic motivation with attitude.

Risk orientation was found to have significant and positive relationship with attitude of pepper growers towards improved agricultural practices. This might be due to the fact that as capacity to take risks increases,

farmers try to understand the practices clearly which lead to the development of a favourable attitude. Similar results were obtained by Kamarudeen (1981), Cherian (1984) and Sajeevchandran (1989).

Cosmopoliteness was found to have significant and positive relationship with attitude of pepper growers towards improved agricultural practices in pepper. This might be due to the contact with other people at the time of their visit to nearest town/city. The interaction with well-informed farmers during the visit help to change their attitude. This result is in conformity with the findings of Kamarudeen (1981) and Viju (1985).

Information source used was found to have significant and positive relationship with the attitude of pepper growers towards improved agricultural practices in pepper. The more the farmers utilize the source of information in agriculture, the more will be their knowledge. The increased knowledge about the practices might have ultimately lead them to develop a favourable attitude. This might be the reason for the positive relationship of information source used and attitude. Similar results were obtained by Kamarudeen (1981) and Sajeevchandran (1989).

Social participation was found to have significant and positive relationship with attitude of pepper growers towards improved agricultural practices. This might be due to the fact that interaction between the member farmers in organisations help exchanging knowledge on new agricultural practices which indirectly help to develop a favourable attitude. This result is in conformity with the findings of Vijaya (1982) and Cherian (1984).

Innovativeness was found to have significant and positive relationship with attitude of pepper growers towards improved agricultural practices in pepper. Innovative pepper growers are likely to have better understanding of improved cultivation practices which lead to a favourable attitude towards improved agricultural practices in pepper. This result is in agreement with the findings of Sajeevchandran (1989).

Contact with extension agency was found to have significant positive relationship with attitude of pepper growers towards improved agricultural practices in pepper. The association of farmers with extension agency help to increase their knowledge about improved agricultural practices and since knowledge is related to attitude there is rationale to relate increased contact with extension

agency with favourable attitude. This finding is in agreement with the findings of Kamarudeen (1981).

Market orientation was found to have significant positive relationship with attitude of pepper growers towards improved agricultural practices in pepper. The knowledge on market of pepper by a pepper grower is important and it can influence the attitude of pepper growers towards improved agricultural practices. If his produce will get an attractive price, a farmer will not hesitate to change his attitude, which leads to adoption. This might be the reason for the positive association of market orientation with attitude. This finding is in agreement with the findings of Sajeevchandran (1989).

5.5.4 Relationship between selected indpendent variables and adoption of improved agricultural practices.

All the independent variables except age was found to be positively and significantly related with extent of adoption of improved agricultural practices in pepper. Age was found to be significantly and negatively related with adoption. So, the hypothesis set for the study that there will be no significant relationship between independent variables and adoption of improved agricultural practices was rejected in the case of age, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency

and market orientation.

Age was found to have negative and significant relationship with adoption of improved agricultural practices in pepper. The direct and indirect effects of younger age might have contributed to the significant relationship with adoption. Farmers of younger age might have opportunities for education, resulting increased knowledge which ultimately might have helped to develop a favourable attitude towards adoption of improved agricultural practices in pepper. This finding is in agreement with the findings of Pillai (1978), Vijayakumar (1983) and Balasubramonian (1980).

Education was found to have positive and significant relationship with adoption of improved agricultural practices in pepper. Naturally education might have raised the level of knowledge and attitude of pepper growers 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. This result was in conformity with the findings of Rajendran (1978), Manivannan (1980), Kamarudeen (1981), Haraprasad (1982), Vijaykumar (1983), Cherian (1984), Anithakumari (1989) and Sajeevchandran (1989).

Scientific orientation was found to have significant and positive relationship with the attitude of pepper growers towards improved agricultural practices in pepper. Scientifically oriented farmers will normally be having correct perception about innovations. The correct knowledge helps to create a favourable attitude leading to the adoption. This finding is in agreement with the findings of Kamarudeen (1981), Anithakumari (1989) and Sajeevchandran (1989).

Economic motivation was found to have significant and positive relationship with extent of adoption of improved agricultural practices in pepper. The significant relationship might be due to the fact that a farmer who invests more money in farming is likely to perceive the increase in yield when he adopts the improved agricultural practices. Economic motive is one of the important motives which moulds the behaviour of individuals and hence it is quite possible that farmers high in this value aspect exhibit a desired behavioural pattern. This result is in conformity with the findings of Beal and Sibley (1967), Singh (1968), Nair (1969), Singh and Singh (1970), Rajendran (1978) and Sajeevchandran (1989) who had reported that economic motivation was significantly correlated with adoption.

Risk orientation was found to have significant and positive relationship with extent of adoption of improved agricultural practices in pepper. This might be due to the fact that as the capacity to take risks increases, farmers try to understand the practices clearly which lead to development of favourable attitude leading to adoption of the improved practices. This finding is in agreement with the findings of Singh (1968), Nair (1969), Singh and Singh (1970), Rajendran (1978), Kamarudeen (1981), Pillai (1978), Cherian (1984) and Anithakumari (1989).

Cosmopoliteness was found to have significant and positive relationship with extent of adoption of improved agricultural practices in pepper. This might be due to the increased knowledge, due to the interaction with other farmers during the visit to the nearest town/city. Greater contact with larger society broadens their knowledge about the improved cultivation practices which leads to increased adoption. This finding is in agreement with the findings of Kamarudeen (1981), Viju (1985) and Prasannan (1987).

Information source used was found to have significant positive relationship with adoption of improved agricultural practices in pepper. The use of various sources of information helps to increase one's knowledge which ultimately leads to appreciable adoption behaviour. This

might have been the reason for the positive relationship of information source used and adoption. This result is in agreement with the findings of Singh and Singh (1970), Naidu (1978), Prasad (1978), Sushamma (1979), Prakash (1980), Prasannan (1987), Anithakumari (1989) and Sajeevchandran (1989).

Social participation was found to have significant positive relationship with adoption of improved agricultural practices in pepper. Membership and participation in different organizations might have helped the pepper farmers to come in contact with different agencies and information sources and hence were likely to be more progressive and receptive to new ideas and practices. The direct and indirect effects of social participation might have contributed to the positive and significant relationship with adoption of improved agricultural practices in pepper. This finding is in agreement with the findings of Somasundaram (1976), Ravichandran (1980), Kamarudeen (1981), Pillai (1978) and Prasannan (1987).

Innovativeness was found to have significant positive relationshp with adoption of improved agricultural practices in pepper. Innovative pepper growers are likely to have better understanding of improved cultivation practices which lead to better adoption of improved agricultural practices.

This might be the reason for the positive relationship of innovativeness and adoption. This finding is in agreement with the finding of Ravi (1974).

Contact with extension agency was found to have significant positive relationship with adoption of improved agricultural practices in pepper. This might be due to the fact that pepper growers having contact with extension agency and participating in extension programmes would have increased the level of knowledge and developed a favourable attitude leading to adoption. This finding is in agreement with the findings of Kamarudeen (1981).

Market orientation was found to have significant positive relationship with extent of adoption of improved agricultural practices in pepper. The market information by pepper growers is important as it influences the attitude of pepper growers which leads to adoption. This might be the reason for the positive association of market orientation with adoption of improved agricultural practices.

5.6. <u>Constraints in the adoption of improved agricultural</u>
<u>practices as perceived by pepper growers and the</u>
<u>suggestions to overcome the constraints.</u>

In the adoption of improved agricultural practices in pepper, the pepper growers face many constraints. It is found that the extensive prevalence of pests and diseases was the most important constraint experienced by pepper growers in the adoption of improved agricultural practices in pepper. Footrot is the most important disease in black pepper. Once affected by the deadly disease, an immediate recovery is not possible. According to farmers, the solutions suggested were to develop disease tolerant varieties and low cost technologies for the control of disease.

High cost of production inputs was found as another important constraint. Due to this, the cost of cultivation will increase. This always acts as an impediment in adoption of newer technologies by pepper growers. The extension worker should pay attention to recommend only low cost technologies which will not call for additional expenditure on the part of the farmers.

The other major constraints were the lack of awareness of improved agricultural practices, traditional systems of cultivation, inadequate extension support, lack

of sufficient good quality planting materials, inadequate research support, long duration rainless period, fluctuating price of pepper, non-availability of literature on improved agricultural practices, non-availability of input materials and small and marginal size of holdings.

Eventhough a high production technology has been developed and is being adopted by several farmers, it is found that a good percent of pepper growers are not adopting the technology in full. This may be due to lack of awareness and non-availability of literature on improved agricultural practices in pepper. An effective extension strategy should be evolved to educate farmers and increase pepper production and productivity.

It is found that good quality planting materials are required to replant the unproductive and senile crop. Adequate infrastructure have to be generated to produce and supply the planting materials.

The dwindling moisture levels is found as a major constraint recurring in the recent years. The yield of pepper has drastically reduced. So, soil moisture conservation measures like mulching the base and contour bunding have to be undertaken. Research to develop drought tolerant varieties has also to be intensified.

Fluctuating prices of pepper is another serious constraint in the adoption of improved agricultural practices. Proper marketing net work coupled with remunerative price to the farmers have to be ensured.

SUMMARY

C H A P T E R - VI

SUMMARY

One of the most important reasons for low productivity of pepper in India is the poor management practices. High production technology has been developed for black pepper in research stations which can increase the production to several folds. But majority of the farmers are not adopting the fruits of research. Being a commercial · crop, proper management and adoption of improved agricultural practices will certainly add to the values of produce besides increasing productivity in pepper.

The present study was an attempt to understaand the adoption behaviour of pepper growers towards improved agricultural practices in pepper and the constraints in the adoption of these practices.

The specific objectives of the study were:

1)   To study the extent of awareness of improved agricultural practices in pepper by pepper growers;

2)   To study the extent of knowledge of improved agricultural practices in pepper by pepper growers;

3)   To study the attitude of pepper growers towards improved agricultural practices in pepper,

4) To study the extent of adoption of improved agricultural practices in pepper by pepper growers,

5) To study the relationship between selected socio-psychological and economic characteristics of pepper growers with their awareness, knowledge, attitude and adoption of improved agricultural practices in pepper,

6) To study the constraints in the adoption of improved agricultural practices in pepper and solutions to overcome the constraints.

The investigation was carried out in Idukki district of Kerala State, which accounts for maximum area under pepper cultivation. From each of the three Agricultural Sub-divisions in this district, one block which was having the maximum area under pepper was selected. The blocks thus selected were Idukki, Kattappana and Adimali. Ten Krishi bhavans were selected randomly at the rate of three each from Idukki and Adimali and four from Kattappana. From each Krishi bhavan 20 pepper growers were selected randomly. Thus the study had a total samle size of 200 respondents. Age, educational status, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact

with extension agency and market orientation were selected as independent variables based on review of literature as well as opinion of judges. Extent of awareness, knowledge, attitude and adoption of improved agricultural practices in pepper were the dependent variables. Constraints experienced by pepper growers in adopting improved agricultural practices in pepper and solutions to overcome constraints were studied. Five numbers of cultivation practices for measuring the extent of adoption were selected based on the popularity of praactice and the opinion of experts of Kerala Agricultural University and subject-matter specialists of the State Department of Agriculture.

Regarding the measurement of variables, educational status was measured using the socio-economic status scale developed by Trivedi (1963) with slight modification in the scoring procedure. The scale developed by Supe (1969) was made use of to measure scientific orientation. Economic motivation was measured by using the scale developed by Supe (1969). Risk preference scale developed by Supe (1969) was used to measure Risk orientation. Cosmopoliteness was measured by using the schedule developed by Desai (1981). Information source used was measured by using the procedure developed by Wilkening (1962). Social participation was

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measured by using socio-economic status cale of Trivedi (1963) with slight modification in the scoring procedure. Innovativeness was measured by using the scale developed by Feaster (1968) with slight modifications. Contact with extension agency was meaasured by using the scoring procedure adopted by Sirajudeen (1980). Age and market orientation were measured by using the scoring procedure developed for the purpose.

The dependent variable, extent of awareness of improved agricultural praàctices in pepper was measured by using the method followed by Salunkhe (1978) with slight modifications. Knowledge about improved agricultural practices in pepper was measured by using a test developed for the purpose. Attitude of pepper growers towards improved agricultural practices in pepper was studied by using the attitude scale constructed for the purpose. Extent of adoption was measured by using adoption quotient suggested by Singh and Singh (1974) which is a modification of the procedure followed by Chattopadhyay (1963).

An interview schedule finalised after pre-testing was using for collecting data from the farmer respondents. The schedule was translated into Malayalam for use in the field. The data were collected by interviewing the

respondents individually. The data were subjected to correlation analysis and step-wise regression analysis. Percentages were also worked out for making simple comparisons.

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

1) The study revealed that majority of pepper growers had medium level of awareness of improved agricultural practices in pepper. The independent variables, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation , innovativeness, contact with extent agency and market orientation were positively and significantly related with awareness of improved agricultural practices in pepper. But age was negatively and significantly correlated with awareness.

2) It was found that majority of pepper growers had medium level of knowledge about improved agricultural practices in pepper. Correlation studies revealed that educational status, scientific orientation, economic motivation, risk orientation, cosmopoliteness, informaktion source used, social participation, innovativeness, contact with extention agency and market orientation had positive and

significant relationship with extent of knowledge about improved agricultural practices in pepper. But age had negative and significant correlation with the extent of knowledge.

3) It was found that majority of pepper growers had medium level of attitude towards improved agricultural practices in pepper. Correlation studies revealed that educational status, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, innovativeness, contact with extension agency and market orientation had significant positive relationship with attitude of pepper growers towards improved agricultural practices in pepper. Age had negative and significant correlation with the attitude of pepper gowerers towards improved agricultural practices in pepper.

4) Regarding the adoption of improved agricultural practices in pepper, majority of the respondents belonged to the medium category. Correlation studies revealed that there was positive and significant relationship between independent variable namely, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness,

information source used,innovativeness, contact with extension agency , market orientation and extent of adoption of improved agricultural practices in pepper. Age had negative and significant correlation with extent of adoption of improved agriculturaal practices in pepper.

5) Stepwise regression analysis revealed that the independent variables,namely, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, innovativeness, contact with extension agency and market orientation selected for the study jointly explained 65 percent of variation in the extent of awareness of improved agricultural practices in pepper.The five variables, namely, education, contact with extension agency, scientific orientation,social participation and market orientation together contributed to 63 percent of the variation. Education emerged as the most important variable in the prediction of the extent of awareness, as this variable alone contributed to 41 per cent of variation.

6) In the case of knowledge about improved agricultural practices in pepper by pepper growers, stepwise

regression analysis revealed that the independent variables, namely, education, contact with extention agency, innovativeness, social participation, scientific orientation, risk orientation, information source used and market orientation had jointly explained about 74 per cent of the variation in the extent of knowledge about improved agricultural practices in pepper. The variables, namely, education, contact with extension agency, innovativeness, social participation and scientific orientation together contributed 72 per cent of the variation. Education alone contributed 50 per cent of variation in the extent of knowledge about improved agricultural practices in pepper. Thus the variable education emerged as the most important one in predicting variation in knowledge about improved agricultural practices in pepper.

7) Step-wise regression analysis revealed that the independent variables, namely, scientific orientation, market orientation, educational status, risk orientation, innovativeness, social participation and age taken for the study had jointly explained about 67 per cent of variation in the attitude of pepper growers towards improved agricultural practices in pepper. The five variables namely, sscientific orientation, market orientation,

education, risk orientation and innovativeness together contributed to 66 per cent of the variation. Scientific orientation alone contributed 41 per cent of variation in the extent of attitude of pepper growers towards improved agricultural practices in pepper. Hence this variable emerged as the most important variable in prediction.

8) Step-wise regression analysis further revealed that the independent variables, namely, education, contact with extension agency, social participation, information source used, innovativeness, scientific orientation and market orientation had jointly explained 59 per cent of variation in extent of adoption of improved agricultural practices in pepper. The four variables, namely, education, contact with extension agency, social participation and information source used, together contributed to 55 per cent variation. Here also education which contributed to 42 per cent of variation in the prediction of extent of adoption, emerged as the most important variable.

9) The pepper growers perceived the following as the major constraints in adoption of improved agricultural practices in the descending order of

magnitude.Extensive prevalence of pest and diseases, high cost of production inputs, lack of awareness of improved agricultural practices in pepper, traditional systems of cultivation, inadequate extension support, lack of sufficient good quality planting materials, inadequate reseaarch support, long duration of rainless period, fluctuating price of black pepper, non-availability of input materials and small and marginal size of holdings.

10) The pepper growers perceived the following as the solutions to overcome the important constraints in the adoption of improved agricultural practices in pepper.

   i)Develop low cost technologies for the control of pests and diseases.

  ii) Develop disease tolerant varieties;

iii) Production and distribution of good quality planting materials.

 iv) Provide adequate training to farmers about improved agricultural practices.

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APPENDICES

APPENDIX - I

LIST OF KRISHIBHAVANS SELECTED FOR THE STUDY

Name of sub. Division	Name of Block	Name of Krishi-bhavans.
1)Thodupuzha	Idukki	1.Kanjikuzhi.
		2.Vathikudy.
		3.Kamakshy
2)Peermade	Kattapana	1.Kattapana
		2.Ayyappancoil
		3.Upputhara
		4.Erattayar
3)Adimali	Adimali	1.Mannamkandam
		2.Pallivasal
		3.Vellathooval

APPENDIX II

KERALA AGRICULTURAL UNIVERSITY

College of Agriculture,Vellayani, 21-2-1992.

From

    Dr.V.B.Padmanabhan,
    Associate Professor,
    Department of Agrl.Extension.

    Dear Sir/Madam,

    Sub:- P.G.Education-Thesis Research Project -
         Judge's Opinion requested - regarding.

One of my students Sri.K.K.Gangadharan has taken up his researchproject on "Adoption of improved agricultural practices in Pepper" for his M.Sc.(Ag)programme. The objective is to study the awareness, knowledge, attitude and adoption of improved agricultural practices by pepper growers of Idukki district.

For this purpose the student researcher has listed out a number of personal, social, psychological and economic variables which may influence the awareness, knowledge, attitude and adoption of improved agricultural pratices in pepper.

I request you to kindly spare some part of the time from your busy schedule to rate the listed variables by putting a tick (✓) mark in the appropriate column.

Thanking you,

                Yours faithfully,

                Sd/-

                V.B.Padmanabhan.

(1)	(2)	(3)	(4)	(5)	(6)

19. Annual income

20. Farm size

21. Indebtedness

22. Market orientation

23. Credit facilities

24. Availability of
    materials

25. Management
        orientation

26. Other variables,
    if any.

    Please specify

                                    signature of the respondent
                                    with name and designation.

LIST OF PERSONAL,SOCIAL, PSYCHOLOGICAL AND ÉCONOMIC VARIABLES
WITH RELEVANCY WEIGHTS SECURED.

Sl.No.	Variables	relevancy weight secured.
1.	Age	0.72
2.	Education	0.94
3.	Farming experience	0.48
4.	Scientific orientation	0.90
5.	Risk orientation	0.66
6.	Progressiveness	0.54
7.	Innovativeness	0.88
8.	Information source used	0.96
9.	Mass media exposure	0.52
10.	Ouccupational status	0.40
11.	Social participation	0.68
12.	Land tenancy	0.36
13.	Listtening behaviour	0.44
14.	Infrastructural facilities	0.48
15.	Cosmopoliteness	0.68
16.	contact with extension agency	0.86
17.	Fatalism	0.36
18.	Economic motivation	0.74
19.	Annual income	0.64
20.	Farm size	0.62
21.	Indebtedness	0.54
22.	Market orientation	0.66
23.	Credit facilities	0.50
24.	Availability of materials	0.44
25.	Management orientation	0.40

ADOPTION OF IMPROVED AGRICULTURAL PRACTICES IN PEPPER IN IDUKKI DISTRICT

INTERVIEW SCHEDULE

1. Name of the respondent :

2. Address   :

3. Name of Panchayat   :

4. Block   :

5. Total area owned   :

6. Age(completed years)   :

7. Education   : Illiterate (   )

   Can read only( )   Can read and write ( )

   Primary level ( )   Middle School level (   )

   High School level( )   Graduate and above ( )

8. Farming experience in
   pepper cultivation(in completed
   years)

9. Scientific Orientation	SA	A	UD	DA	SDA
1. New methods of farming give better results to a farmer than old methods.					
2. The way of farming by our forefathers is still the best way to farm today.					
3. Even a farmer with a lot of farm experience should use new methods of farming.					
4. A good farmer experiments with new ideas of farming.					

5. Though it takes time for
   a farmer to learn new methods in farming
   it is worth the efforts.

6. Traditional methods of
   farming have to be
   changed in order to
   raise the standard of
   living of a farmer.

10. Economic motivation

1. A farmer should work
   towards larger yield
    and economic profits.

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

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

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

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

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

11. Risk orientation.

1. A farmer should grow large
   number of crops to avoid
   greater risk involved in
   growing one or two crops.

2. A farmer should rather take
   more of a chance in making a
   big profit than to be content
   with a smaller but less
   risky profit.

3. A farmer who is willing to
   take a greater risk than
   the average farmer usually
   do better financially.

4. It is good for a farmer to
   take risks when he know his
   chance of success is
   fairly high.

5. It is better for a farmer
   not to try farming unless
   most of other farmers
   have used it with success

6. Trying an entirely new
   method in farming by a
   farmer involves risk but it
   is worthy.

12. Cosmopoliteness
   Please indicate how frequently you visited the nearest town
   and the purpose of your visit.

(a) Frequency of Visit:

1) Never ( )   2.Occasionally ( )

3) Once in a montth ( )
4)) Once in a fortnight ( )
5) Once in a week ( )
6) Two or more times in a week ( )

(b) Purpose of visit

1) All visits relating to agriculture ( )
2) Some relating to agriculture ( )
3) Personal/domestic matters ( )
4) Entertainment ( )
5) Others ( )
6) No response ( )

13. Information source used:

Please indicate from which of the following sources you obtained technial information regarding new innovations in pepper cultivation.

Source	Once in a week	Once in a month	Once in two months	Never
1) Mass Media				
T.V.				
Radio				
Film				
Newspaper				
Others(specify)				
2) Interpersonal cosmoplite sources				
Agricultural Officers				
Agricultural Assistants				
Others(specify)				
3) Interpersonal localite sources				
Neighbours				
Friends				
Relatives				
Others (specify)				

14. Social participation

Do you participate in the
activities of any organization   Yes/ No

If yes, please indicate your
position in the organization.

1. Membership in one organization   (   )
2. Membership in more than one organi-
   zation.   (   )
3. Office bearer in the organization   (   )
4. Office bearer in more than one
   organization   (   )
5. Distinctive features (Office bearer
   at state level or National level)   (   )

15. Innovativeness

1.   Yes   UD   No
   Do you want to learn new ways
   of farming?

2. If the Agricultural Extension workers
   give a talk on improved cultivation
   aspects, would you attend?

	YES	UD	NO

3. If the Government would help you to estaablish, a farm elsewhere, would you accept?

4. Do you want to change in your way of life?

5. A farmer should try to farm the way in which his parents did.

6. Do you want your sons to be farmers.?

7. It is better to enjoy today and let tomorrow take care of itself.

8. A man's future is in the hands of God.

16. Contact with extension agency:

a. Are you aware about extension agency   Yes/ No

b. Frequency of contkact with extension Agency.

    1. Beyond 3 months   ( )
    2. Once in 3 months   ( )
    3. Once in a month   ( )
    4. Once in 15 days   ( )
    5. Once in a week   ( )

c. Purpose of contact

    1. Non-agriculture   ( )
    2. To avail input assistance   ( )
    3. To avail subsidies and agricultural
       implements.   ( )
    4. To get technical guidance   ( )

17. Market orientation   SA   A   UD   DA   SDA

1. One should grow those crops which have more market demand.

2. Market news is not useful to a farmer.

3. One should sell his produce to the nearest market irrespective of price.

4. Grading the produce helps the farmer
   to get high price.

5. Market intermediaries are not necessary
   for marketing a product.

6. Produce should be stored until a farmer
   get a high price for it.

18. Awareness of farmers towards improved agricultural practices
    in Pepper.

1. Are you aware of the new High Yielding
   Varieties of pepper released from pepper
   Research Station, Panniyur? If yes, please   ..Yes/No
   mention the names.
   1.
   2
   3

2. Are you aware that June-July is the best season for
   planting pepper in Kerala?   Yes/No.

                aware
3. Are you of the fertilizer recommendation
   for pepper?   Yes/ No

4. Are your aware that psytosanitation in
   pepper garden will reduce the spread of
   diseases of pepper ?   Yes/ No

5. Are you aware that inferior genetic base of
   cultivars is one of the main reason for low
   productivity of pepper in the State?   Yes/ No

6. Are you aware that the continuous cultivation
   of pepper under poor management will deplete the
   soil fertility?   Yes/No

7. Are you aware that the slope facing south
   should be avoided for planting pepper?   Yes/No.

8. Are you aware that change in ecology will
   definitely affect the pepper production
   in Kerala ?   Yes/No

19. Knowledge of farmers about improved agricultural practices of pepper

1. Name a high yielding variety of pepper ....,

2. Indicate fertilizer mixture recommended for pepper cultivation.

a. 8: 8: 16   c) 10: 10: 10
b. 10: 14: 14   d) 40:20:40

3. What is the spacing given to pepper?

a. 4.5m x 4.5 to 6 m x 6 m

b. 2.5 m x 2.5 to 3 m x 3 m

c. 8 m x 8 m   (d) 10 m x 10 m

4. How much quantity of copper sulphate is required for preparing
   1 litre of Bordeaux paste.

a) 10 kg   (b) 100 gms   (c) 1 kg   (d) 500 gms.

5. Name of important pest of pepper.

....

6. Name an important disease of pepper.

....

7. What is the fertilizer recommendation (NPK) for pepper
per year? (NPK)/year.

a) 90 :45: 45   b) 100: 40: 140
c) 10: 20: 20   d) 340: 70: 680

8. Name the cheapest chemical for the control of quick wilt.

....

9. Please mention the chemical used for control of Pollu beetle.

a. Copper sulphate (b) Furadan   (c) Hinosan   (d) Ekalux.

10. Mulching the base of pepper vines will
    adversely affect the root development.   True/False

19. **Knowledge of farmers about improved agricultural practices of pepper**

1. Name a high yielding variety of pepper ....

2. Indicate fertilizer mixture recommended for pepper cultivation.

a. 8: 8: 16   c) 10: 10:   10
b. 10: 14: 14   d) 40:20:40

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. . . .

6. Name an important disease of pepper,

. . . .

7. What is the fertilizer recommendation (NPK) for pepper
per year? (NPK)/year.

a) 90 :45: 45   b) 100: 40: 140
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8. Name the cheapest chemical for the control of quick wilt.

. . . .

9. Please mention the chemical used for control of Pollu beetle.

a. Copper sulphate (b) Furadan   (c) Hinosan   (d) Ekalux.

10. Mulching the base of pepper vines will
    adversely affect the root development .   True/False

10. <u>Attitude of farmers towards improved agricultural practices in pepper.</u>

	SA	A	UD	DA	SDA

1. Use of chemical fertilizer is very much important in increasing pepper production.

2. Integraated management of pests and diseases is a wasteful expenditure in pepper production.

3. Adoption of improved agricultural praáctices is highly risky and hence it is not advisable to follow the same.

4. Improved agircultural practices for pepper will not increase pepper production.

5. When climate is favourable there is no need to adopt improved agricultural practice for pepper.

6. To have better yield all farmers should cultivate High Yielding varieties of pepper

7. Soil testing in pepper garden is a waste of money.

8. Application of organic manure will? cause increased incidence of pests and diseases.

9. Soil conservation is most important to maintain fertility status of pepper gardens.

10. It is not profitable to adopt improved agricultural practices in pepper.

11. Dipping berries in hot water has not much effect in improving the quality of pepper.

12. When pepper production is less there is no need to follow spacing but follow close planting.

13. Application of chemical fertilizer will
    adversely affect the quality of pepper.

14. Providing shade to younger plants
    is a waste of labour.

15. One need not hesitate to apply chemical
    fertilizers for pepper.

16. Shade regulation in pepper garden
    is a waste of labour.

21. <u>Extent of adoption of improved agricultural practices in pepper.</u>

1. Total area under pepper cultivation ....
2. Extent   of area in which H.Y.V. is cultivated ....
3. What is the area in which the recommended spacing of
   2.5m x 2.5m to 3 m x 3 m is followed?.....

4. What is the quantity of organic manure applied/Vine?

                                                    .....Kg

5. What is the quantity of chemical fertilizer
   applied/vine ? N.....gm.....P .....gm..... K.....gm

6. Do you use plant protection chemicals against pest/
   disease? If yes, please give the following details.

Name of pest/disease	Total area affected by pest disease	Name of pesticide/fungicide used.	Dosage.	Total area sprayed

22. constraints in the adoption of improved agricultural practices
    in pepper.

Sl.No.	Constraints	Most Impor- tant	somewhat Import- ant	Less Important
1.	Lack of sufficient good quality planting materials.			
2.	High cost of production/inputs.			
3.	Inadequate extension support.			
4.	Small and marginal size of holdings.			
5.	Traditional systems of cultivation.			
6.	Extensive prevalence of pests and diseases.			
7.	Lack of awareness of improved agricultural practices in pepper.			
8.	Non-availiability of input materials.			
9.	Inadequate research support.			
10.	Non-availability of literature on improved agricultural practices Others if any(Please specify)			
11.				
12.				

23. Mention your solution for the problems stated as Most important:

PROBLEM	solutions (In the order of importance)
1.	1.
2.	2.
3.	3.

ADOPTION OF
IMPROVED AGRICULTURAL PRACTICES
BY PEPPER GROWERS OF
IDUKKI DISTRICT

BY
GANGADHARAN K. K.

ABSTRACT OF THE THESIS
Submitted in partial fulfilment of the requirement for the degree
MASTER OF SCIENCE IN AGRICULTURE
(Agricultural Extension)
Faculty of Agriculture
Kerala Agricultural University

Department of Agricultural Extension
COLLEGE OF AGRICULTURE
Vellayani – Thiruvananthapuram

1993

ABSTRACT

The study on the adoption of improved agricultural practices in pepper was conducted in Idukki district of Kerala with the following objectives:

1)   To study the extent of awareness of improved agricultural practices in pepper by pepper growers.

2)   To study the extent of knowledge about improved agricultural praactices in pepper by pepper growers.

3)   To study the attitude of pepper growers towards improved agricultural practices in pepper.

4)   To study the extent of adoption of improved agricultural practices in pepper.

5)   To study the relationship between the extent of awareness, knowledge, attitude and adoption with the socio-psychological and economic characters of pepper growers;

6)   To identify the constraints in adoption of improved agricultural practices in pepper and to suggest solutions to overcome the constraints.

A total of 200 pepper growers were selected from 10 Krishi bhavans for the study, using stratified two-stage sampling procedure.

Data were collected by using a structured interview schedule during the months of June and July 1992. The important findings of the study were the following.

A majority of pepper growers in the study area had medium level of awareness of improved agricultural practices in pepper. The independent variables, namely, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency and market orientation were positively and significantly related with awareness. But age was found negatively and significantly correlated with awareness of improved agricultural practices in pepper.

Majority of pepper growers had medium leel of knowledge about the improved agricultural practices in pepper. The independent variables, namely, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency and market orientation were positively and significantly related with knowledge of improved agricultural practices in pepper, whereas age was found negatively and significantly correlated with knowledge.

In the case of attitude of pepper growers, majority of pepper growers had a medium level of attitude towards improved agricultural practices in pepper. Education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency and market orientation were positively and significantly related with attitude of pepper growers towards improved agricultural practices in pepper. Age was found negatively and significantly correlated with attitude.

A majority of pepper growers in the study area had medium level of adoption of improved agricultural practices in pepper. The independent variables namely, education, scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, social participation, innovativeness, contact with extension agency and market orientation were positively and significantly related with adoption of improved agricultural practices in pepper. Age was found negatively and significantly correlated with adoption.

Step-wise regression analysis revealed that education was the most important variable in prediction of the extent

of awareness, followed by scientific orientation, economic motivation, risk orientation, cosmopoliteness, information source used, innovativeness, contact with extension agency and market orientation. The seven variables jointly explained 65 per cent of variation in extent of awareness of improved agricultural practices in pepper. Education alone contributed 41 per cent of variation in prediction.

In the case of knowledge about improved agricultural practices in pepper, education was found as the most important variable in prediction, which alone contributed 5o per cent of variation in the extent of knowledge. The independent variables, namely, education, contact with extension agency, innovativeness, social participation, scientific orientation, risk orientation, information source used and market orientation had jointly explained about 74 per cent of variation in the extent of knowledge about improved agricultural practices in pepper.

Scientific orientation was found as the most important variable in prediction of attitude of pepper growers towards improved agricultural practices in pepper. The variables, namely, scientific orientation, market orientation, educational status, risk orientation, innovativeness, social participation and age had jointly explained 67 per cent variation in the attitude of pepper

growers towards improved agricultural practices in pepper. Scientific orientation alone contributed 41 per cent of variation in prediction.

Education was found as the most important variable in the prediction of adoption of improved agricultural practices in pepper. This variable alone contributed 42 per cent of variation in prediction. Fifty nine per cent of variation was explained by the seven variables, namely, education, contact with extension agency, social participation, information source used, innovativeness, scientific orientation and market orientation.

The pepper growers perceived the following as the major constraints in adoption of improved agricultural practices in the descending order of magnitude; extensive prevalence of pests and diseases, high cost of production inputs, lack of awareness of improved agricultural practices in peper, traditional systems of cultivation, inadequate extension support, lack of sufficient good quality planting materials, inadequate research support, long duration of rainless period, fluctuating prices of black pepper, non-availability of literature on improved agricultural practices, non-availability of input materials and small and marginal size of holdings.

The following were the solutions suggested to overcome important constraints in adoption of improved agricultural practices by pepper growers:

Develop low cost technologies for the control of pests and diseases,

Develop disease and drought tolerant varieties.

Production and distribution of good quality planting materials.

Adequate training to farmers about improved agricultural practices.

Implementation of soil and moisture conservation measures .

Proper marketing network coupled with remunerative price of Black pepper.

Supply of newer high yielding varieties to farmers.