Adoption Behaviour of Tribal Farmers Towards Improved Agricultural Practices

By

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THESIS

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1985

DECLARATION

I hereby declare that this thesis entitled "ADOPTION BEHAVIOUR OF TRIBAL FARMERS TOWARDS IMPROVED AGRICULTURAL PRACTICES" 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.

Vellayani,

31 - 12 - 1985

VIJU, A.

CERTIFICATE

Certified that this thesis entitled "ADOPTION BEHAVIOUR OF TRIBAL FARMERS TOWARDS IMPROVED AGRICULTURAL PRACTICES" is a record of research work done independently by Sri.VIJU, A. 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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My sincere gratitude is due to the Kerala Agricultural University for awarding me a merit scholarship for my Post-graduate studies. The contageous enthusiasm of Sri.T.Madhava Menon, Vice-Chancellor of the Kerala Agricultural University in promoting tribal welfare activities has given me an urge to conduct the study on the tribes with dedication and objectivity.

Last but not the least, I express my deep sense of gratitude and indebtedness to my parents and my brother Shri. A.Jayan for their great moral support which enabled me to complete this venture successfully.

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INTRODUCTION

CHAPTER I

INTRODUCTION

Tribal people form the decisively poorest section of the Indian society. According to Census 1981, India has about 29.9 million tribal population which accounts for about seven per cent of the total population of the country. About three per cent* of the tribal population live in urban areas while the rest on the hilly terrains of the country.

A comparative analysis of the tribal as well as non-tribal population will reveal their lower placement in society. Only about nine per cent* of the tribal population in India are literates. The literacy percentage of the tribal population is far below the average when compared to the rest of the population in the country. In among the negligible tribal literates, most of them are educated only upto the primary level.

In respect of employment status, it is seen that 57 per cent* of the tribal population are economically active, as compared to the national average of 43 per cent* in agricultural pursuits.

Nearly 90 per cent* of the tribal population in India depends on agriculture for their livelihood while only 67 per cent* of the general population are engaged in agricul-

* Census Of India, 1981.

tural pursuits. Of those tribals who are engaged in agriculture in one way or the other, 52 per cent* are cultivators while the rest are agricultural labourers. Again, among the tribal cultivators, 69 per cent* cultivate their own land while nine per cent cultivate partly owned and partly leased lands. Rest of the tribal cultivators (22 per cent*) cultivate on leased lands.

About 6.6 per cent* of the tribal population are engaged in secondary sectors such as mining, household industry etc., whereas 14.4 per cent* of the general population are engaged in secondary sector.

Inspite of their unique position in Indian population, they are still downtrodden and uncared for by majority of the so called 'upper sector'.

According to Sharma (1977), Indian tribes while they live in beautiful places with an air of tranquility and a culture of their own with an old-world charming tempo of life, their living conditions in terms of the present day amenities are primitive in nature. Not only in the matter of physical conditions, but also in terms of behaviour and mental make up, the tribal people are still centuries behind their metropolitan counterparts.

Tribes of Kerala

According to the Census of 1981, the population of Kerala State is 254,53,680. Of this, the population of

* Census of India, 1981

scheduled tribes is 2,61,475. The Scheduled tribes thus constitute 1.03 per cent of the total population of the State. District-wise tribal population in the State is given in Table 1.

Table 1. Distribution of members of Scheduled tribes in the districts of Kerala State (1981 Census)

Sl. No.	District	Scheduled tribe population	Percentage of scheduled tribes to the total population of the district
1.	Cannanore	39,704	1.42
2.	Wynad	95,557	17.25
3.	Kozhikode	3,888	0.17
4.	Malappuram	7,955	0.33
5.	Palghat	28,794	1.41
6.	Trichur	3,227	0.13
7.	Ernakulam	3,551	0.14
8.	Idukki	38,712	3.98
9.	Kottayam	15,227	0.90
10.	Alleppey	3,273	0.14
11.	Quilon	7,442	0.26
12.	Trivandrum	14,145	0.54

The tribal communities living in Kerala have been divided into seven major territorial groups viz. Kasaragod, Wyanad, Attappady, Nilambur, Parambikulam, Idukki and Trivandrum (Mathur, 1981).

There are 35 scheduled tribes in Kerala (Appendix I). The largest group of tribes in the southern Kerala is the 'Kanikkar' popularly known as 'Kanis'.

The legend is that they came to be known as Kanikkars when they submitted to the Attingal Raja and made presents of honey, cardamom and ivory, that they came to be known as Kanikkar (Iyer, 1937).

The Kanikkars live mainly in the forests of Nedumangad and Neyyattinkara taluks. Inside the reserve forests, they are agriculturalists. Thurstone (1975) remarked "the jungle Kanikkars have no permanent abode, but shift about from one part of the forest to another". This is in contradiction with the conditions prevailing. Shifting cultivation known as 'Punam' was practised by most of the tribal communities in the State in the past. Most of them have now given up this practice mainly due to the rigorous rules introduced by the Forest Department, prohibiting their freedom to move from one place to another within the forest area.

Need for the study

Development problems of the tribes are unique by themselves. Each tribal area has reached a particular level of development and each tribe has its own distinctive

pattern of living. Inspite of the implementation of the various developmental activities, substantial progress in the tribal areas could not be achieved. Only a few studies have been taken up till now, to see how far these programmes helped to bring about a desirable change in the attitude of the tribes towards improved agriculture thereby enhancing the rate of adoption of the improved agricultural practices. It is true that the State Planning Board, Kerala Institute for Research Training and Development studies of Scheduled Castes and Scheduled Tribes (KIRTADS) Calicut and the Bureau of Economics and Statistics have conducted some studies to find out changes in the social life of the tribal community. ~~But~~ These studies are mostly exploratory and do not investigate in depth the adoption behaviour of the tribal farmers. Hence the present study was undertaken to investigate the adoption behaviour of tribal farmers towards improved agricultural practices.

General objective of the study

The general objective of the study was to find out the adoption behaviour of tribal farmers towards improved agricultural practices.

Specific objectives

The specific objectives of the study were:

1. To study the extent of knowledge about the improved agricultural practices by the tribal farmers.
2. To study the attitude of tribal farmers towards farming.
3. To study the extent of adoption of improved agricultural practices by the tribal farmers.
4. To study the relationship between the extent of knowledge, attitude, adoption and socio-psychological and socio-economic characters.
5. To identify the constraints in the adoption of improved agricultural practices by the tribal farmers.
6. To suggest measures to enhance the rate of adoption.
7. To study the cultural anthropological characteristics of the selected tribe with special reference to folklore* on agriculture.

Importance and scope of the study

Tribal people form the decisively poorest section of Kerala's population. Modern agricultural technology is not recognised by the tribal farmers as an essential element in improving their economic conditions and they mainly resort to the traditional subsistence farming. As such, there is an immediate need for the adoption of scientific agricultural technology by the tribal farmers which could increase the production and thereby enhance the income of the tribal

* "Folk-lore is the material that is handed on by tradition, either by word of mouth or by materials
Custom and practice. It may be folk songs, folk tales, riddles, proverbs, or other preserved in words. ---------" Islam (1978).

people. It would be worth while to study the causes hindering the adoption of scientific agricultural technology by the tribal farmers for developing a better strategy for enhancing the rate of adoption.

Limitations of the study

A study of the type on the tribal farmers has its own difficulties, for the areas they dwell are remote making it difficult to establish contacts with them. Moreover, a student researcher has the limitations of resources such as time and finance. The study was conducted among the Kanikkars of Nedumangad taluk only so that the generalizations made in the study are to be reinforced by other comprehensive studies in other tribal areas of Southern Kerala. These limitations were taken into consideration in deciding the variables, sample selection and sample size. However, all efforts have been taken to make the study as objective as possible.

Layout of the study

The thesis is divided into six Chapters. The first Chapter deals with introduction, giving the need, objectives, importance and scope, and limitations of study. The second Chapter presents the theoretical orientation and is related to the review of literature pertaining to the area.

In the third chapter, the methodology used in the research work including the operationalization of the concepts, measurement procedures of variables and statistical procedures used are given. The fourth chapter deals with the results based on the statistical analysis. The fifth chapter deals with the discussions based on the results obtained. The last chapter contains the summary arrived from the study.

The references and appendices are given at the end.

THEORETICAL ORIENTATION

CHAPTER II

THEORETICAL ORIENTATION

A review of the existing literature on a topic helps the researcher to design the theoretical frame work of his study and also to assess the nature and quantum of research studies already undertaken in the area of his research. Keeping this in view, an attempt was made to review the related literature. The main objective of this chapter was to portray in broad outlines the conceptual frame work of reference that has been used for the study. This will provide a theoretical basis for the empirical investigation.

This chapter is divided into five parts. The first part deals with the concept of Tribe. The second part concerns itself with the dependent variables of the study. The third part deals with the relationship of indpendent variables with the dependent variables. In the fourth part, the constraints encountered in the adoption of improved agricultural practices reviewed are given. In the fifth part, the hypotheses formulated with respect to the variables are presented. At the end, the conceptual frame work of the study is given diagramatically.

1. Concept of Tribe

According to Oxford dictionary, a tribe is a group of people in a primitive stage of development acknowledging the

authority of a chief and usually regarding themselves as having a common ancestor.

Madan (1967) defined tribe as follows "A tribe descends from common biological mythical or legendary ancestor, it occupies a defined territory, it has a common history, the tribe speaks a common dialect and it is invariably endogamous".

Mamoria (1951) reported that the people in India included a very large number of primitive tribes who subsist on hunting, fishing or by simple forms of agriculture. They are assigned with different names like aboriginals, hill tribes, animists, primitive tribes, jungle people, forest tribes or folks, original owners of the country, backward Hindus, submerged humanity etc. He further described the common feature of tribe as " . . . . . .living away from the civilized world in the inaccessible parts lying in the forests and hills, they belong either to one of the three stocks of Negritos, Australids or Mangoloids, speak the same vebal dialect, profess primitive religion known as 'animism' in which the worship of ghosts and spirits are the most important elements and follow primitive occupations such as hunting, collecting forest produces etc."

The anthropologist's conception of a tribe "as a small, culturally distinct and economically self sufficient community with a language of its own and an autonomous political organisation" is utterly inappropriate to the so called tribal groups in India (Goswami, 1984). Some go to the extent of stating that the concept of a tribe is an anachronism in the present day world, since there is no criterion to divide humanity into two branches, tribes and non-tribes. In the present day world, smaller, isolated, technologically backward communities have either become extinct or have become part of one or the other greater civilizations of the world. However, Indian anthropologists have depicted tribes as small, self contained, self sufficient and autonomous communities practising subsistence economy with limited external trade.

For social scientists, tribes are those which are included in the scheduled tribe list in the constitution of India. The 414 tribes listed following the 1956 Presidential Notification differ greatly in their habits, modes of production, degree of isolation, degree of aculturation, level of development, social customs, beliefs and so on.

II. Adoption behaviour

Adoption behaviour necessitates both obtaining knowledge on innovations (covert behaviour) and the actual use of these

innovations (overt behaviour) by an individual. At operational level, attitude towards modern innovations is also a type of behaviour, to be inculcated in the clientele through educational and development activities. Production of favourable changes in these three important aspects of the behaviour of tribes should therefore necessarily be resulted, for the upliftment.

It can be argued that the attitude towards farming and knowledge about improved agricultural practices are prerequisites for the adoption of improved agricultural practices, and that attitude and knowledge level are only related factors, (independent variables) of the adoption behaviour (dependent variable). ~~But~~ It is not the nature of the variables that make them dependent or independent, but the way in which they are used. As the knowledge level and attitude towards improved agricultural practices of the tribe are also the products of the development activities, they are considered and used here as dependent variables.

In the light of the above reasoning, extent of knowledge about improved agricultural practices, attitude towards farming and extent of adoption of improved agricultural practices are used in this study as the dependent variables.

A. Extent of knowledge about improved agricultural practices

One of the main tasks of extension education is to provide or improve the knowledge of the people about the improved agricultural practices, because knowledge as a component of behaviour plays an important role in the total behaviour of the individual. Greater knowledge of improved practices would lead to higher adoption. Once knowledge is acquired and retained in the mind, it undergoes and produces changes in the thinking process and a sort of 'mental alchemy' will take place. The result of this active functioning of knowledge may sometimes be seen in the overt behaviour of the individual, ie. in the action or in the decision taken.

English and English (1958) defined knowledge as the body of understood information possessed by an individual or by a culture. Knowledge is knowing what to do next, skill is knowing how to do it and virtue is doing it.

Ramsey et al. (1959) suggested that cognitive adoption (covert) includes obtaining knowledge and critical evaluation of the practices 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 farmer.

Menon (1970) found that meetings and trainings helped in knowing about the improved seeds, fertilizers and implements for small farmers.

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

Many researchers have established positive and significant association of knowledge with adoption of farm practices (Earnest, (1973); Jha (1974); Bhilegaonkar, (1976); Somasundaram, (1976); Balasubramaniam, (1977); Tripathy, (1977); Vijayaraghavan (1977); Kaleel, (1978); Prasad, (1978); Pillai, (1978); Samad, (1979); Mishra and Sinha (1980); Surendran, (1982).

Surendran (1982) reported that there was significant relationship between knowledge and attitude towards scientific agriculture.

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

From the above review, it therefore appears that knowledge about improved agricultural practices is the major input for promotion of attitude towards farming and adoption of improved agricultural practices among the farmers irrespective of the economic standing and resourcefulness.

Since studies of this variable in the tribal situation are inadequate, it has been decided to include this variable in the present study.

B. Attitude towards farming

According to Allport (1935), attitude is a mental and neural state of readiness organised through experience, exerting a directive or dynamic influence upon the individual's 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.

Krech and Crutchfield (1948) defined attitude as an enduring organisation of motivational, emotional, perceptual and cognitive processes with respect to some objects of an individual's world.

New Comb (1950) speaks of attitude as a state of readiness for motive arousal and an individual's attitude towards something in his pre-disposition to perform, perceive, think and feel in relation to it.

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

Kuppuswamy (1964) stated that attitudes are learned in the course of life experience which make the individuals behave in characteristic ways towards persons, objects or issues to which they get related.

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

Sharma (1972) defined attitude as a personal disposition which impels an individual to react to some object or situations.

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

Many researchers have established the positive and significant association of attitude with adoption of farm practices (Nair, (1969); Singh and Singh, (1971); Somasundaram, (1976); Balasubramoniam, (1977); Tripathy, (1977); Sinha (1978); Pillai, (1978); Mohanadasan, (1979); Singh (1981); Surendran, (1982).

Since detailed studies of attitude of tribal farmers towards improved agricultural practices are not available, this variable has been included in the present study.

C. Extent of adoption of improved agricultural practices

Wilkening (1952) postulated adoption of innovation as a process composed of learning, deciding and acting over a period of time. The adoption or a decision to act has a series of actions and thought decisions.

Copp et al. (1958) defined adoption as an activity of the farmers taking place over a period of time. They perceived adoption of farm practices as a bundle of related events flowing through time, not an instantaneous metamorphosis.

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

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 knowledge and critical evaluation of the practice in terms of individual situations.

Rogers (1962) defined adoption process as the mental process through which an individual passes from the first hearing about an innovation to its final adoption.

Katz et al. (1963) defined diffusion adoption process as the acceptance over-time of some specific items- an idea or practice by an individual, group or adopting unit limited to specific channels of communication to a social structure and to a given system of values or culture.

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

Rogers and Shoemaker (1971) defined adoption as a decision to continue the full use of an innovation as the best course of action.

Adoption research became part of the main stream of rural sociology in the early 1940's. Anthropologists like Suttle (1951) and Sharp (1952) attempted to emphasize the social consequences of innovations and their effects on adoption. Socio-psychological approach was the main criterion in Wilkening's (1952) researches. Sociometric analysis was utilised by Coleman (1955) in his study on adoption of soil conservation practices by farmers. He observed that the adoption of farm practices was influenced by social, psychological and economic factors of the individual respondents. Sawhney (1961), while examining the factors and forces contributing

towards the wide difference in adoption and enhancing the process of acceptance, found that they can be explained better from social, psychological and economic point of view. Basaram (1966) conducted a study on motivational and resistance forces related to acceptance of new ideas in Indian farming and concluded that sociological, psychological and economic variables of the farmers are important in explaining their attitude towards new ideas and techniques, and final adoption of them.

III. Socio-psychological variables and their relationship with the dependent variables

1. Educational status

Educational level of farmers is seen influencing their knowledge level and their attitude towards farming which in turn influences their adoption level.

Supe and Salode (1975) reported that formal education was significantly related to level of knowledge of farmers.

Kaleel (1978) and Balachandran (1983) reported significant association between education and level of knowledge, while Surendran (1982) observed no significant association between educational level of the farmers and their knowledge level.

Mathew (1980) observed no significant association between education and attitude towards scientific agriculture, among the rural youth club members.

But researchers like Kamarudeen (1981), Naik (1981), Vijayakumar (1982) and Cherian (1984) reported positive and significant association between education and attitude.

Many researchers have established positive and significant relationship of educational status with adoption (Perumal, 1970, Viswanathan, (1972), Chandrakandan, (1973), Kamble (1973), Ramamoorthy, (1973), Vellapandian, (1974).

Prakash (1980) in his study among the tribals of Wyanad district had also brought out the positive relationship between educational status and extent of adoption of improved agricultural practices.

2. Social participation

Social participation was reported by many researchers to have positive and significant association with the adoption of farm practices (Roy et al. (1968), Chandrakandan (1973), Ramamoorthy (1973), Anbalagan (1974), Bhilegaonkar, (1976), Palaniswamy, (1978), Sadamate, (1978), Mishra and Sinha, (1980), Ravichandran, (1980), Kamarudeen, (1981), Pillai, (1983). Researchers like Sundaraswamy (1971), Rao (1972), Viswanathan,

(1972); and Sathivel (1979) reported non-significant association between social participation and adoption.

Mathew (1980) observed no significant association between social participation and attitude towards agriculture, whereas Das and Sarkar (1970), Vijaya (1982) and Cherian (1984) reported positive association between attitude and social participation.

3. Risk orientation

Kamarudeen (1981) observed significant relationship between risk preference and attitude of farmers towards demonstrated cultivation practices.

Naik (1981) and Cherian (1984) also reported significant association between risk preference and attitude of farmers.

Many researchers have established positive and significant association between risk orientation and adoption behaviour of the farmers (Jaiswal (1965); Ernest (1973); Ramachandran (1974); Singh (1975); Tripathy (1977); Rajendran (1978); Sethy (1978); Pillai (1983)).

4. Economic motivation

Somasundaram (1976) and Janakiramaju (1978) reported positive association between economic motivation and knowledge about improved agricultural practices.

The positive and significant association between economic motivation and adoption of improved agricultural practices have been established by many researchers (Hobbs (1964); Seal and Sibley (1967); Singh (1968); Nair (1969); Singh and Singh (1970).

5. Cosmopoliteness

Cosmopoliteness was reported by many researchers to have a positive and significant relationship with the extent of knowledge of farmers (Knight and Singh (1975); Somasundaram (1976); Kamarudeen (1981); Balachandran (1983); Siddaramiah and Rajanna (1984).

Mathew (1980) observed no significant association between cosmopoliteness and attitude towards farming among the rural youth club members.

Researchers like Fliegel (1960) and Chauhan and Sinha (1976) reported that there was no significant relationship between cosmopoliteness and extent of adoption of improved agricultural practices, whereas Kittur (1976), Channegowda (1977) and Kamarudeen (1981) have established a positive and significant association between cosmopolitness and the extent of adoption.

6. Fatalism

Sen (1969) reported that the leader's fatalism does not influence the adoption behaviour of others.

Burman and Sharma (1970) found that the question of values had been found to affect the adoption of settled agriculture where lands were available with the tribals or made available by the Government.

Dar (1970) reported that the tribal attitude, tradition and religion made it difficult for the tribals to accept restriction on shifting cultivation. The isolation of the tribal areas from being exposed to new ideas make them extremely tradition-bound.

Goswami and Saikia (1970) observed that the social and cultural backgrounds make the introduction of modern agriculture in the tribal areas a difficult task.

Sahu (1970) reported that due to the prevalance of rigid, traditional social and cultural outlook, tribal agriculture could rightly be classified as subsistence sector of the tribal economy.

B. Socio-economic variables and their relationship with the dependent variables

1. Annual income

Many researchers have established a positive and significant association between income and the extent of adoption (Lionberger, (1960); Jaiswal and Singh (1968); Hussian, (1971); Perumal and Duraiswamy, (1972); Chandrakandan, (1973);

Kaleel, (1978); Pillai, (1978); Sushama (1979).

Das and Sankar (1970) reported that annual income of farmers was positive and significantly correlated with attitude towards improved agricultural practices.

Sushama (1979) reported that there was significant relationship between income of tribes and the attitude towards modern living practices in more developed areas.

Kamarudeen (1981) reported that the income level of the neighbour farmers was not significantly related with the attitude towards the demonstrated practices, but the income level of control group of farmers was positively and significantly related with their attitude.

Sushama (1979) observed no significant relationship between income of the tribes of Wyanad and their knowledge level regarding modern living practices.

Kamarudeen (1981) reported that the income of neighbour and control group of farmers was not significantly correlated with their knowledge.

2. Indebtedness

Salunke and Thorat (1975) reported that indebtedness of small farmers had a significant relationship with adoption behaviour. Tribal indebtedness according to Mathur (1977)

is both a cause and effect of poverty and is related to bonded labour and alienation of tribal land. The study by Mathur (1979) revealed that the most important causes of indebtedness among the tribals of Keralaware their primitive agricultural technology, illiteracy, low wages, absence of marketing infrastructure and their social and religious obligations.

Mathur also reported that those tribals who have improved seeds and modern technology of cultivation were more heavily indebted than those who have not responded to improved techniques.

Sadamate (1978) reported that indebtedness was positively and non-significantly related to the technological gap in the tribal farming system.

Prakash (1980) reported a positive and significant relationship between indebtedness and adoption of improved agricultural practices in the medium developed tribal areas of Wyanad, while this relationship was not significant in less developed areas.

Prakash (1980) also reported that study on the association between indebtedness and attitude of tribals towards settled agriculture indicated that there was no significant relationship between the two in both the medium and less developed areas.

No study closely related to the indebtedness and the extent of knowledge about improved agricultural practices could be reviewed.

3. Status of land tenancy

Dhaliwal (1963) reported that owner farmers influenced the tenants in adoption of selected agricultural practices. Average adoption index was high in the case of owner operators than that of the tenants. Kaushal and Malik (1973) found that full and high adoption of fertilizers was positively and significantly correlated in the case of self-owned farmers only.

Tripathy (1977) observed a negative relationship between land-tenure status and technological gap index of farmers in adoption of new rice technology.

Singh (1981) found no significant relationship of adoption with the status of land ownership, except in the case of marginal farmers, where it was positively and significantly correlated.

Pillai (1983) reported that status of land tenancy was found to have no association with technological gap in integrated soil conservation practices in the case of low, medium and high gap categories of farmers.

No study relating the status of land tenancy to the dependent variables extent of knowledge and attitude towards farming could be reviewed.

To sum up, from the reviews presented in this Chapter covering studies on adoption of practices, it could be seen that certain characters were influencing the adoption of improved agricultural practices. The inadequacy of relevant studies on the adoption behaviour of the tribal people of Kerala was also revealed in this endeavour, which again brings forth the apparent need for undertaking an indepth study on the adoption behaviour of tribal farmers in improved agricultural practices.

IV. Constraints encountered in adoption of improved agricultural practices

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

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

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

ChennaGowda and Jalihal (1974) pointed out the important reasons for non-adoption of high yielding varieties of rice as lack of conviction about their superiority and unsuitability of these varieties for late planting.

Mathur (1975) revealed that the most important causes of indebtendness among the tribals of Kerala are their primitive agricultural technology, illteracy, low wages, absence of marketing infrastructure and their social and religious obligations. Mathur also reported that those tribals who have improved seeds and modern technology of cultivation were more heavily indebted than those who have not responded to improved techniques.

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

Puri (1978) reported land alienation, indebtedness, low educational standards, inadequate supply of essential consumer goods, low agricultural production and productivity, inadequate marketing facilities etc. as major problems of tribal areas.

Sadamate (1978) reported that various socio-psychological economic and communication constraints were found to be related to the attitude towards farming of the tribals.

Sripal (1981) reported that the factors responsible for the non-adoption of improved practices in cotton cultivation were: not in practice, not profitable, high cost, not known and no effect. He stated that the main problem was the high rise in the price of inputs.

The reasons for non-adoption of recommended practices in the dry land agricultural technology as stated by Bhaskaram and Praveena (1982) were: lack of knowledge, lack of guidance, high cost, risky, lack of time, lack of conviction, no felt need, lack of credit, poor weather, not profitable, requires high skill, work done by government agency, unsatisfactory experience, no experience, less fodder, incidence of pests and diseases, non-availability of inputs and not essential.

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

Pillai and Prasad (1983) reported the following constraints faced by 'Muduvas', a tribal community of parambikulam area of Kerala.

1. Erratic monsoon rains.
2. Non-availability of good quality seeds or seedlings.

3. Lack of technical guidance on improved farming.
4. Pest attack on rice and cardamom.
5. Lack of facilities for extracting lemongrass oil.
6. Non-availability of improved agricultural implements.
7. Low price for the produce, and
8. Inadequate help from forest officials.

V. Hypotheses

Based on the review of literature and in the light of the objectives of the study and variables selected, the following hypotheses were formulated to test the relationship of the dependent variables with the independent variables.

General hypothesis (GH)-1.

There will be significant association between extent of knowledge about improved agricultural practices of the tribal farmers and the socio-psychological and socio-economic variables.

Sub-hypotheses (SH)-1

There will be significant association between extent of knowledge about improved agricultural practices of the tribal farmers and their -

1. Educational status,
2. Social participation,
3. Risk orientation,
4. Economic motivation,
5. Cosmopoliteness,
6. Fatalism,
7. Annual income,
8. Indebtedness, and
9. Status of land tenancy.

General hypothesis (GH)-2

There will be significant association between the attitude of tribal farmers towards farming and the socio-psychological and socio-economic variables.

2. Sub-hypotheses (SH)-2

There will be significant association between attitude towards farming of the tribal farmers and their-

1. Educational status,
2. Social participation,
3. Risk orientation,
4. Economic motivation,
5. Cosmopoliteness,
6. Fatalism,
7. Annual income
8. Indebtedness and
9. Status of land tenancy.

General hypothesis (GH)-3

There will be significant association between extent of adoption of improved agricultural practices and the socio-psychological and socio-economic variables.

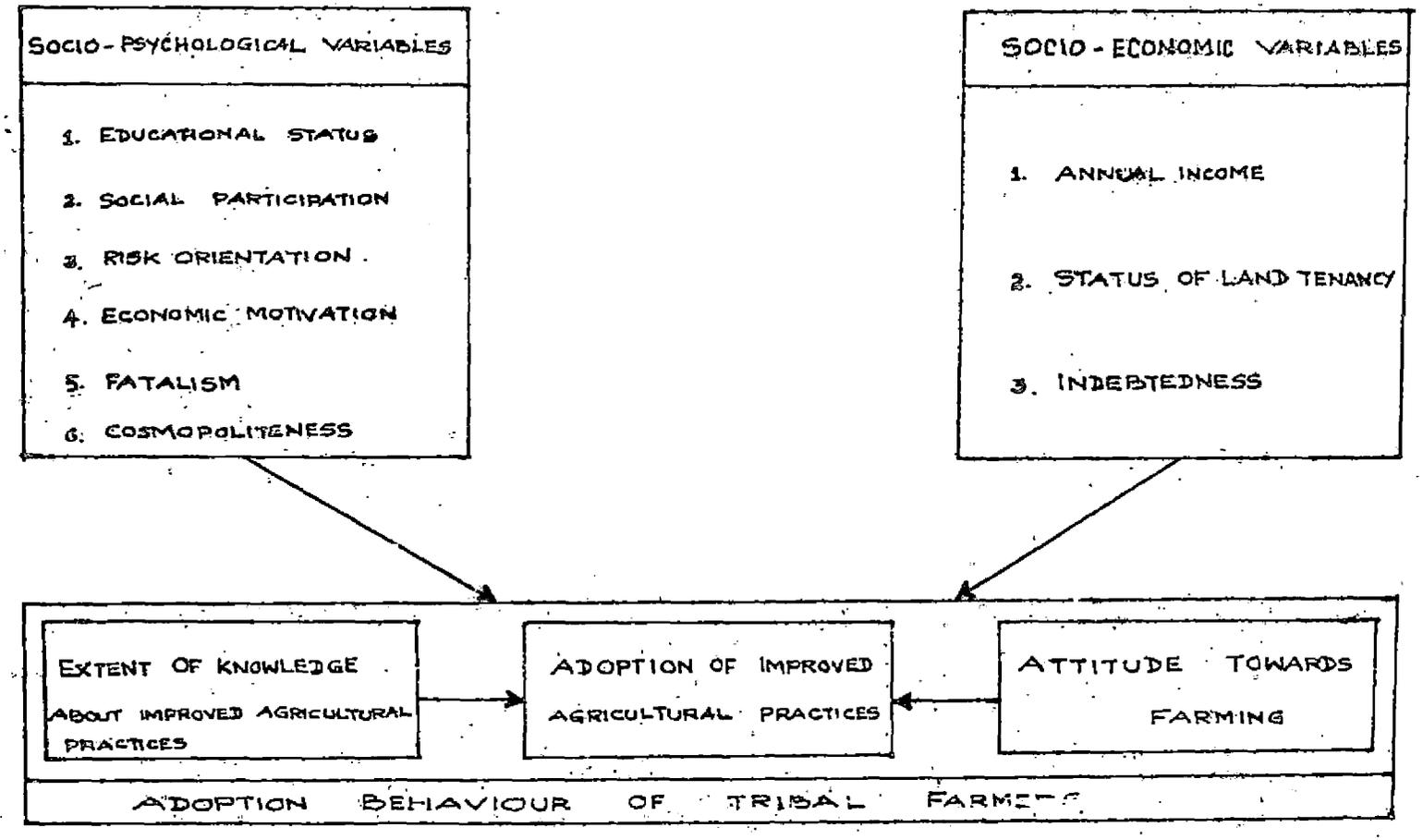
3. Sub-hypotheses (SH)-3

There will be significant relationship between extent of adoption of improved agricultural practices by the tribal farmers and their-

1. Educational status,
2. Social participation,
3. Risk orientation,
4. Economic motivation,
5. Cosmopoliteness,
6. Fatalism,
7. Annual income
8. Indebtedness, and
9. Status of land tenancy.

The conceptual frame work of the study is given in diagramatically in fig 1.

FIG. 1. CONCEPTUAL FRAME WORK OF THE STUDY



METHODOLOGY

CHAPTER III

METHODOLOGY

This chapter deals with the research methods and procedures used in the study and are presented under the following sub-headings.

A. Sampling

B. Description of the study area.

C. Selection and empirical measurement of variables

D. Techniques of data collection.

E. Statistical methods used.

A. SAMPLING

The head of the selected household constituted the sampling unit referred to in this study.

Selection of District

According to the Census of 1981, Kerala had a total population of 25,453,680 of which 261,475 belonged to Scheduled tribes (1.03 per cent). Out of the 48 tribal communities in the State 35 are Scheduled tribes and the rest denotified tribal communities (Mathur 1977). Of these 35 scheduled tribes, the largest group in Southern Kerala is the "Kanikkars". They form the fifth major tribal community of the State in population as they account for 5.68 per cent of the tribals (Bureau of Economics and Statistics, 1979). They are a typical community of the

South and distributed only in five taluks of Trivandrum and Quilon districts. Of the total kanikkar households, about 80 per cent are concentrated in Nedumangad taluk of Trivandrum district. Hence the district of Trivandrum was selected for the study.

Selection of Taluk

Trivandrum district is administratively divided into four taluks viz. Chirayinkil, Nedumangad, Neyyattinkkara and Trivandrum. Among these four taluks, Nedumangad has the maximum number (10,783) of Scheduled tribes. Hence Nedumangad Taluk was purposively selected as the locale for the study. The distribution of Scheduled Tribes in the four taluks of Trivandrum district is given in Table 2.

Table 2. Population of Scheduled tribes in Trivandrum district (Taluk-wise)

Taluk	Total tribal population	Rural	Urban
Chirayinkil	69	68	1
Nedumangad	10,783	10,727	56
Trivandrum	948	267	681
Neyyattinkara	2,345	2,326	19
Total	14,145	13,388	757

Source: Census of India 1981 series - 10 Kerala (Part II B)

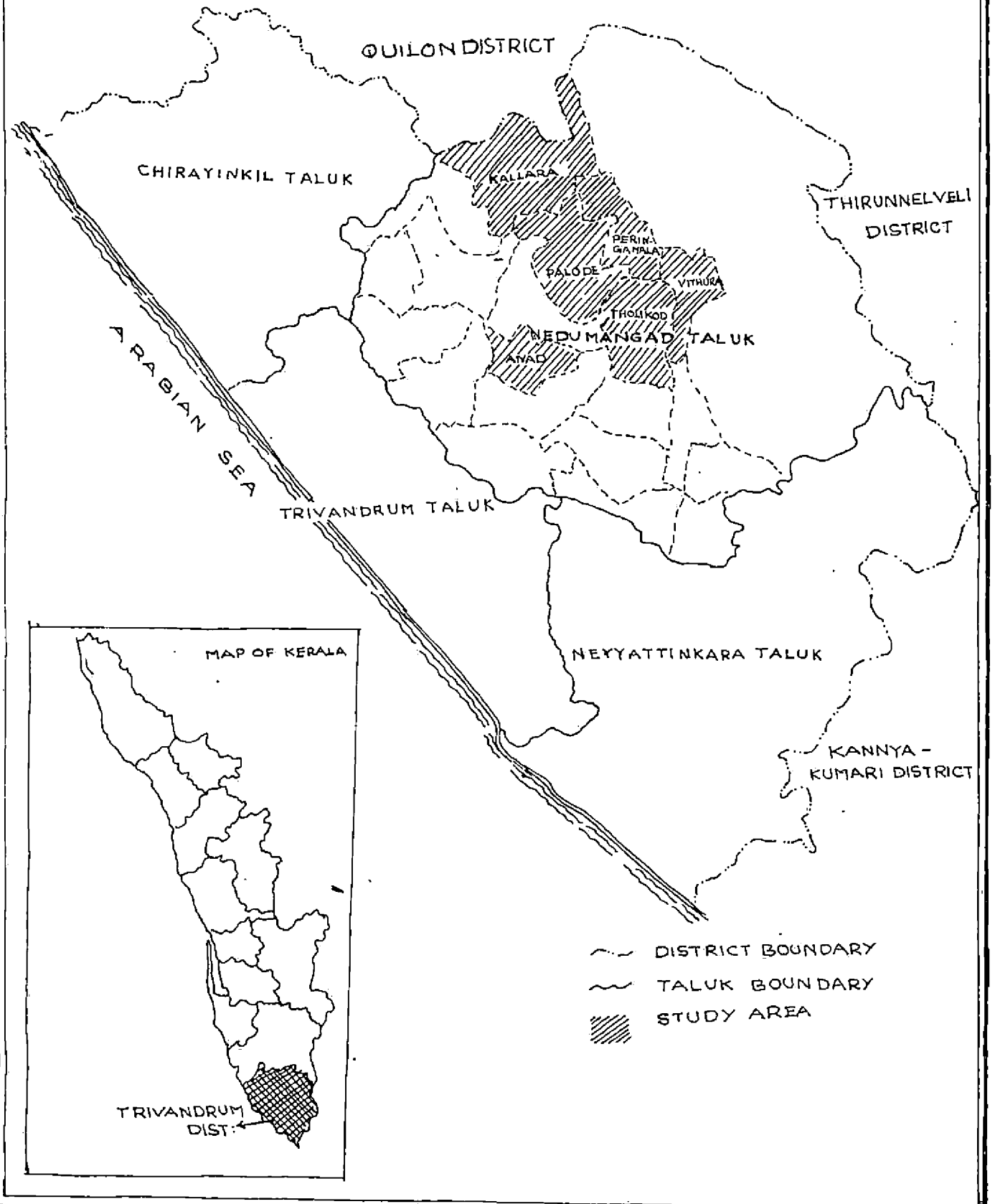
FIG- 2

TRIVANDRUM DISTRICT

SHOWING TALUKS

SCALE 1CM = 3.25KM

RF 1:325000



Selection of Villages

Nadumangad taluk consisted of 20 villages. The tribal population in each village of Nadumangad taluk is given in Table 3. From these 20 villages, six villages having higher tribal population were selected for the study. They are Thalikod, Vithura, Palode, Kallara, Peringamala and Anad in the descending order of size of tribal population. From these six villages, further selection of the respondents for the study was made.

Selection of Respondents

The address of the heads of families in each settlement of the selected six villages were collected from secondary data. (Source: Village offices) The names of the heads who are farmers in each settlement were arranged in alphabetic order for selecting the sample. Using the Table of random numbers the farmers were selected at random. Samples proportionate to the total number of families in each selected village were selected, as given in Table 4. A total sample size of 110 for the study was obtained. Both the sample and population are from the only community in the area viz. 'Kanikkars'.

Table 3. Details about the population of Scheduled tribes in Nedumangad taluk (Village-wise)

Sl. No.	Village	Area in sq.km.	No. of households	Population.	Scheduled tribe population
1.	Nallanad	18.46	3.521	18,729	3
2.	Vamanapuram	27.43	4 750	24,394	-
3.	Kallara	49.49	6 340	33,531	685
4.	Pullampara	35.64	4 829	25,432	90
5.	Manickal	33.34	5 305	28,054	37
6.	Vembayam	30.58	5 347	28,052	156
7.	Karakulam	31.37	8 108	42,319	42
8.	Nedumangad	0.63	102	642	-
9.	Anad	24.15	4 610	23,864	328
10.	Panavur	21.90	3 015	15,624	44
11.	Palode	38.72	4 656	23,003	1383
12.	Peringamala	43.05	5 216	26,812	405
13.	Vithura	28.83	3 685	17,539	1729
14.	Tholikod	28.74	4 730	25,332	1825
15.	Uzhamalakkal	18.75	3 372	17,255	64
16.	Vellanad	28.30	5 526	28,237	213
17.	Perumkulam	21.26	4 069	21,038	238
18.	Ariyanad	22.92	4 415	22,518	32
19.	Mannurkara	19.74	2 888	14,745	17
20.	Veeranakavu	18.19	4 166	20,529	238

Table 4. Distribution of Respondents in the selected Villages

Sl. No.	Name of the Village	Total No. of settlements.	No. of families	Total population.	Sample size selected
1	Tholikod	9	108	1825	11
2	Vithura	15	549	1729	55
3	Palode	6	220	1389	22
4	Kallara	4	58	685	6
5	Peringamala	8	147	405	15
6	Anad	2	14	328	1
	Total	44	1,096	6,355	110

B. Description of the study area

Trivandrum district lies in the southern-most region of Kerala State. Nedumangad Taluk which is the study area, is located in Trivandrum district and it lies in north latitude between $8^{o}36'$ and $8^{o}45'$ and in East longitude between 77^{o} 00' and 77^{o} 07'. The taluk comprises of 926.8 sq. km out of which an area of 50.16 sq. km is under forest. The elevation varies from 60 m to 1074 m above MSL.

The rainfall varies from 215 cm to 420 cm. The climate is humid tropical and the temperature varies from 10^{o} to 35^{o}C

(Meteorological centre, Trivandrum). The important crops cultivated in the taluk are tapioca, coconut, paddy, arecanut and to a certain extent rubber and tea.

According to 1981 census, Trivandrum district had a total tribal population of 14,145 of which the tribes of Nedumangad taluk accounts for a population of 10,783 (76.23 per cent). The increase in tribal population during 1971-81 in the taluk was from 7518 to 10783, as compared to the increase in non-tribal population being from 432,761 to 514,231.

The map of Nedumangad taluk is given in Figure 2.

C. Selection and empirical measurement of variables

Detailed review of literature and a pilot study in the area before finalising the methodology were made use of in selecting the variables. Judges rating was relied upon for the final selection of the variables. The list of variables selected along with the instruments used to measure them is given below:

Variables	Measurement
1. Extent of knowledge about improved agricultural practices	Using the test developed for the purpose.
2. Attitude towards farming	Using the scale developed by Sademate (1978).
3. Extent of adoption of improved agricultural practices.	Using the scale developed for the purpose.

Independent variables

a. Socio-psychological variables

1. Educational status	Using the socio-economic status scale developed by Trivedi (1963) with slight modification in the scoring procedure.
2. Social participation	Using the procedure developed by Lokhande (1974)
3. Risk orientation	Using the Risk preference-scale developed by Supe (1969).
4. Economic motivation	Using the Economic motivation-scale developed by Moulik (1965).
5. Cosmopoliteness	Using the schedule developed by Desai (1981).
6. Fatalism	Using the scale developed by Chattopadhyay (1963) as followed by Verma (1970).

b. Socio-Economic variables:

1. Annual income	Using the schedule developed for the purpose.
2. Status of land tenancy	Using the scoring procedure developed for the purpose.
3. Indebtedness	Using the schedule developed for the purpose.

Measurement of the dependent variables

1. Extent of knowledge about improved agricultural practices

One of the dependent variables for the study was the extent of knowledge of the tribal farmers in improved agricultural practices. Since tapioca was the major crop in the area, the measurement was confined to the knowledge of the tribal farmers in tapioca cultivation. A knowledge test with items confining to tapioca cultivation was developed for the purpose.

Knowledge was defined by Bloom et al. (1956) as "those behaviours and test situations which emphasized the remembering either by recognition or recall of ideas, material or phenomenon". A standardised knowledge test was developed by following the procedures used by Khuspe (1970), Lokhande (1973), Reddy (1976), Sadamate (1978) and Pillai (1983).

The steps followed in developing a knowledge test for the study are described below:

Collection of items

The content of a knowledge test is composed of questions called items. An item pool of questions was prepared by reviewing literature such as the package of practices recommendations of the Kerala Agricultural University (1982)

and conducting discussions with the subject matter specialists and the extension personnel of the University. Finally, a thorough scrutiny of the item pool was made with the assistance of the subject matter specialists. The selection of the items was done on the basis of the following criteria.

1. The items should promote thinking
2. It should differentiate the well informed tribal farmers from the poorly informed ones, and
3. It should have a certain difficulty index

Forty items (questions) which covered all aspects of tapioca cultivation were selected to carry out item analysis for developing a standardised knowledge test (Appendix IIA).

Forms of questions

All the forty items collected for construction of the knowledge test were in the objective form. The questions were dichotomous with correct/incorrect type and yes/ No type, involving impersonal and objective assessment.

Item analysis

The initially prepared forty items were checked and modified on the basis of pretesting and administered to thirty respondents prior to the preparation of the final

schedule. The respondents were randomly selected tribal farmers practising tapioca cultivation who were altogether different from the sample selected for the main study and at the same time having identical conditions.

Item analysis yields two kinds of information: item difficulty and item discrimination. The index of item difficulty reveals how difficult an item is whereas the index of discrimination indicates the extent to which an item discriminates the well informed individuals from the poorly informed ones.

Scores of value one and zero were given to correct and incorrect responses respectively for the dichotomous questions. There was thus a possibility of respondents scoring a maximum of forty points for all correct answers and a zero for all wrong answers.

The scores obtained by the thirty respondents were arranged in the descending order of total scores, from the highest to the lowest and the respondents were divided into three equal groups arranged in descending order of total scores obtained by them. These groups were G_1, G_2 and G_3 with ten respondents in each group. For item analysis, the middle group namely G_2 was eliminated retaining only the terminal ones with high and low scores.

The data pertaining to correct responses for all the items in respect of these 2 groups G_1 and G_3 were tabulated; and the difficulty and discrimination indices calculated (Appendix-IIB).

An example of the calculation of the difficulty and discrimination indices is presented below.

Table 5. Difficulty and discrimination index of knowledge test items 6,8 and 21.

Item number in the initial test.	Frequency of correct answers		Total frequencies N = 30	Percentage of respondents giving correct responses (P)	$E^{1/3}$
	S_1	S_3			
6	10	7	17	56.67	0.30
8	7	1	8	26.67	0.60
21	9	1	10	33.33	0.80

Where

P = index of item difficulty

$E^{1/3}$ = index of discrimination

$$E^{1/3} = \frac{(S_1) - (S_3)}{N/3}$$

Where S_1 and S_3 are the frequencies of correct answers in the group G_1 and G_3 respectively.

N = Total number of respondents in the sample

Substituting the values for item number 6 of the above table, the value arrived at:

$$E^{1/3} \text{ for item } 6 = \frac{10-7}{30/3} = 0.30$$

a) Calculation of item difficulty Index

The index of item difficulty as worked out in this study refers to the percentage of the respondents answering an item correctly. As Coombs (1950) pointed out, the difficulty of an item varied for different individuals. In the present study, the items with P values ranging from 26.67 to 56.67 were considered for final selection for knowledge test.

b) Calculation of Discrimination Index

The second criterion for item selection was the discrimination index indicated by $E^{1/3}$. Mehta (1958) in using $E^{1/3}$ method to find out item discrimination values emphasised that this method was somewhat analogous to, and therefore a convenient substitute for the phicoefficient as formulated by Perry and Michael (1951). In the present study, the items with $E^{1/3}$ values ranging from 0.30 to 0.90 were considered for the final selection. In their studies, Lokhande (1973) Reddy (1976), Sadamate (1978) and Pillai (1983) had put these units as 0.35 to 0.55, 0.17 to 0.7, 0.12 to 0.87 and 0.35 to 0.50 respectively. The selected 14 items for the final format of the knowledge test are given in Appendix IIB.

Scoring

The summation of scores for the correct answers over all the items for a particular respondent indicated his level of knowledge in improved agricultural practices of tapioca. The knowledge index was worked out for individual respondents by the following formula.

$$\text{Knowledge index} = \frac{\text{total score obtained by a respondent}}{\text{total number of statements}} \times 100$$

Reliability

The split-halves method was used to test the reliability of the test. All the 14 items of the knowledge test were divided into two equal halves each having seven odd numbers and seven even numbers and administered to thirty respondents. The coefficient of correlation between the two sets of scores was 0.811, which was significant at 1 per cent level of probability. This indicated that the reliability of the test was high.

Content validity

Content validity is a kind of validity by assumption as described by Guilford (1971).

Care was taken to include items covering the entire universe of relevant aspects of knowledge in improved agricultural practices of tapioca. Items were collected through

various sources such as specialists in Agronomy, Extension and Soil Science and also the Subject matter specialists of the Department of Agriculture so that it was assumed that the test could measure the knowledge of the tribal farmers in improved agricultural practices of tapioca.

2. Attitude of tribal farmers towards farming

Attitude scale provides the means of assessing the degree of affect that individuals may associate with some psychological object.

In this study, attitude towards farming was operationalised as the tribal farmer's degree or favourableness or unfavourableness towards farming and was measured with the help of an attitude scale developed by Sadamate (1978) to measure the attitude of tribal farmers towards farming.

This scale included ten statements of which five statement were positive and the rest were negative. The responses were rated on a three-point continuum viz. agree, undecided and disagree. The scoring procedure for positive statements were given below.

Sl.No.	Response(s)	Score(s)
1	Agree	3
2	Undecided	2
3	Disagree	1

For the negative statements the scoring procedure was reversed.

3. Extent of Adoption of Improved Agricultural Practices

The approach followed in the present study to operationalise adoption was based on the conclusion derived from a review of the following studies.

Wilkening (1952) used an index for measuring the adoption of improved farm practices. The index of adoption used was the percentage of practices adopted to the total number of practices applicable for the adoption studied.

Hieget (1956) constructed an index of adoption of farm practices using the correlation of several adoption-variables; non-adoption was given a score of zero and adoption a score of one.

Chathopadyaya (1963) used adoption quotient for measuring adoption behaviour. This is a ratio scale that measures a farmer's behaviour on dimension of applicability, potentiality, extent, time, consistency and differential nature of innovation.

Supe (1964) developed the cotton practices adoption scale. He selected ten practices of cotton and for each practices, the total score for complete adoption was six. The practices which were divisible were assigned partial scores for partial adoption.

Singh and Singh (1974) used the adoption quotient method of Chattopadhyay (1963) with slight modification.

The formula used was as follows:

$$\text{Adoption quotient} = \frac{\leq e/p}{N} \times 100$$

Where

$\leq$ = The summation

e = Extent of adoption of each selected practice

p = potentiality of adoption of each selected practice and

N = the total number of selected practices

Sundaraswamy and Duraiswamy (1975) developed 'Adoption quotient' to measure the adoption behaviour. They took 13 practices and farmers were classified as low adopters (A.Q. 10-40%), medium adopters (A.Q. 40-80%) and high adopters (A.Q.80-100%).

In this study, an adoption scale was developed to suit the purpose as given below:

The scale was developed on the basis of the composite score of single practices which were logically consistant. Selection of the practices were made in consultation with the experts on the field and the package of practices recommendation of the Kerala Agricultural University (1982).

Scores were given to individual items on the basis of the response of the tribal farmer to the questions as to whether he had adopted a practice or not as follows:

Item	Score
1. Using high yielding variety	1
Not using high yielding variety	0
2. Using chemical fertilizers	1
Not using chemical fertilizers	0
3. Using proper spacing for planting	1
Not using proper spacing for planting	0
4. Use of inter cultural operations	
(a) Weeding	1
(b) Earthing up	1
Not using intercultural operations	0
5. Growing intercrops in tapioca plots	1
Not growing intercrops in tapioca plots	0

The total score obtained by a tribal farmer on the scale was considered as a measure of his adoption behaviour.

Independent variables

The independent variables were selected on the basis of an extensive review of literature, discussion with experts and on the basis of a pilot study conducted by the researcher among the 'Kanikkars'. A list of twentytwo variables considered to be important based on the above procedures were sent to judges for their judgement with regard to their relevance with the dependent variables. The judges were drawn from the field of Agricultural Extension of the Kerala Agricultural University, Department of Sociology of the

Kerala University and also from the officers involved in tribal development. Those variables judged by them as most relevant to the dependent variables were selected for detailed investigation. The variables thus selected were educational status, social participation, risk orientation, economic motivation, cosmopoliteness, fatalism, annual income, status of land tenancy and indebtedness.

X_1 Educational status

In this study, education was operationalised as the number of years of formal education attained by the tribal farmer at the time of interview.

The socio economic status scale of Trivedi (1963) with slight modification in the scoring procedure was followed to measure educational status. According to this, the tribal farmers were categorised as illiterate, can read only, can read and write, primary school, middle school, High school and above. The scoring procedure was as follows:

Level	Score
Illiterate	0
Read only	1
Read and write	2
Primary school	3
Middle school	4
High school and above	5

X_2 Social participation

Sadamate (1978) defined social participation of the respondent 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 tribal farmer in social organisations as a member or as an office bearer and regularity in his attendance to the meetings.

The procedure developed by Lokhande (1974) was used for the purpose of measuring social participation. The scoring procedure was:

Items	Scores
No membership	0
Membership in one organisation	1
Membership in more than one organisation	2
Office bearer in one organisation	3
Office bearer in more than one organisation	4
Distinctive features (MLA, M.P. etc.)	6

Attendance to meeting either as a member or as an office bearer was considered important. Scores for attending meetings, 'regularly' occasionally and 'never' were given scores as 3,2 and 1 respectively. To obtain the final score of a respondent, the scores secured as a member or office bearer were multiplied with the scores secured for attendance in meetings and added up.

X_3 Risk Orientation

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

In this study, risk orientation is operationalised as the degree to which a tribal farmer is oriented towards encountering risk and uncertainity in adopting new ideas or practices in agriculture.

To measure risk orientation, the risk preference scale developed by Supe (1969) was followed. This consisted of six statements rated on a five point continuum ranging from 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree' with scores 7,5,4,3 and 1 respectively for the positive items and scores 1,3,4,5 and 7 for the negative items respectively.

X_4 Economic motivation

In farming system, economic motivation may be regarded as an indication of the degree of willingness for investment of available potential resources in adopting farm innovations. The farmer who views himself to be economically motivated may seek more monetary gains than a farmer with values such as freedom from debt and self-sufficiency.

In this study, economic motivation of the tribal farmer was measured with the help of the self-rating economic motivation-scale developed by Moulik (1965). The scale consisted of three sets of statements, each set having three short statements with weights 3,2 and 1 indicating high medium and low degree of economic motivation. The forced choice method was followed to overcome the familiar problems of personal bias and lack of objectivity in self evaluation. This method forced the respondent to choose from a group of three short statements describing a particular personality characteristic, the one which most accurately described the respondent himself and also the one which least accurately portrayed himself.

After obtaining the respondents 'most-least' choices for each of the three sets of statements, the scoring was done by summing up the ratios of the weight of the 'most-like' statement to the weight of 'least-like' statement. As there were three sets of statements for the economic motivation scale, the sum of the ratios for the three sets was the respondent's self-rating score for economic motivation.

X_5 Cosmopoliteness

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

In this study, cosmopoliteness was operationally defined as the tendency of the tribal farmer to be in contact with outside world based on the belief that all the needs of an individual cannot be satisfied within his own community.

The procedure followad 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 to the nearest town in a month

Frequency of visit	Score
Twice or more a week	5
Once a week	4
Once a fortnight	3
Once a month	2
Very rarely	1
Never	0

b) Purpose of visit to the town in a month

Purpose of visit	Score
All visits relating to agriculture	5
Some relating to agriculture	4
Personal or domestic matters	3
Entertainment	2
Any other purpose	1
No purpose	0

The total score of cosmopoliteness for each respondent was calculated by adding the score of the above two dimensions of cosmopoliteness.

X_6 Fatalism

Rogers (1962) defined fatalism as the degree to which an individual perceives a lack of ability to control his future.

In this study, fatalism is operationalised as a belief of the tribal farmer that human situations and acts were pre-determined by some supernatural power and can never or little be influenced by individual violation or by act of any one else.

To measure fatalism, the scale developed by Verma (1970) was used. The scale consisted of five items on a four point continuum of which the first and second items were negative and the rest positive. The points of the continuum were 'strongly agree','agree' 'disagree' and'strongly disagree' with scores 4,3,2 and 1 respectively for the positive items and scores 1,2,3 and 4 for the negative items respectively.

X_7 Annual Income

In this study, annual income has been operationally defined as the total annual earning of the respondent from

both farm and non-farm sources. The farm sources indicate the income obtained from the cultivation of land owned or leased-in and the non-farm sources include income from the collection of minor forest products, farm and non-farm labour wages, dairy#poultry etc.

As the tribal farmers were unable to state the annual income in exact figures, it was decided to group them into different categories and scores were assigned as follows:

Income level	Score
Upto Rs.1000/-	1
Above Rs.1000/- and upto Rs.2000/-	2
Above Rs.2000/- and upto Rs.3000/-	3
Above Rs.3000/- and upto Rs.4000/-	4
Above Rs.4000/-	5

X_8 Status of land tenancy

Status of land tenancy, in this study has been defined as the fraction of the cultivable land owned by the respondents which is in his possession. It was calculated by using the formula.

$$\text{Status of land tenancy} = 1 - \frac{\text{extent of own cultivable land now under possession of the respondent in hectares}}{\text{total cultivable land owned by the respondent in hectares}}$$

If the respondent possesses all the land owned by him, the status of land tenancy could be zero.

X_9 Indebtedness

Indebtedness in the present study referred to the total land(debt) in terms of money a tribal farmer owes at the time of the investigation and to various money lending sources such as private money lenders, co-operatives, merchants, traders etc.

On the basis of the total debt a farmer had at the time of investigation, the following scoring procedure was followed.

Item	Score
No debt	0
Debt upto Rs.500/-	1
Debt above Rs.500/- and upto Rs.1000/-	2
Debt above Rs.1000/- and upto Rs.1500/-	3
Debt above Rs.1500/-	4

D. Techniques of data collection

Interview schedule was used for data collection. A pilot study was conducted in the tribal area before finalisation of the schedule. To study the cultural and anthropological characters of the tribe, participant observation, discussions with tribal leaders and review of anthropological books were made use of.

Construction of schedule

The draft schedule was finalised only after pre-testing and making suitable modifications. In pre-testing, care was taken not to take samples from the settlements selected for the study, but from nearby settlement areas having identical conditions.

Interview schedule is given in Appendix-III

Date collection

Data collection work was carried out during July to September 1985. The schedule was translated into 'Malayalam' and read out to tribal farmer respondents.

E. Statistical Methods used

The data for advanced statistical procedures were processed at the computer centre of the Kerala University, Trivandrum. For analysis of the data of this investigation, the following statistical tests and procedures were applied.

1. Percentages

Percentages were calculated for making simple comparisons in identifying the constraints. Percentages were calculated upto two decimals, after the decimal point.

ii. Simple correlation

This was computed to find out the intensity of association between the dependent variables and each of the independent variable.

iii. Stepwise Multiple Regression

This was done to know the relative effect of the independent variables in predicting the dependent variable and for elimination of unimportant variables. The best fitting regression equation of dependent variable on independent variables was predicted by applying stepwise regression (Draper and Smith, 1966).

iv. Path analysis

Singh and Chowdhary (1977) defined path coefficient as the ratio of the standard deviation of the effect due to a given cause to the total standard deviation of the effect. Path analysis was carried out to find out the direct and indirect effects of the important independent variables on adoption of improved agricultural practices, knowledge about improved agricultural practices and attitude towards farming.

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.

I. Extension of knowledge about the improved agricultural practices by the tribal farmers.

II. Attitude of tribal farmers towards farming.

III. Extension of adoption of improved agricultural practices by the tribal farmers.

IV. Correlation analysis between the independent variables and the dependent variables.

V. Relative importance of the selected socio-psychological and socio-economic characteristics and their contribution in explaining the dependent variables.

VI. Direct and indirect effects of the independent variables on the dependent variables.

VII. Constraints in the adoption of improved agricultural practices by the tribal farmers.

VIII. Cultural-anthropological characteristics of the selected tribe with special reference to their folklores on agriculture.

I. Extent of knowledge about the Improved Agricultural Practices by the Tribal farmers

The knowledge score for the sample obtained for the agronomic practices of tapioca have been given in Table 6. The tribal farmers could be categorised into three viz. low, medium and high knowledge categories based on mean and S.D. A tribal farmer with a knowledge score below 29.642 is considered to have a low level of knowledge, whereas one whose knowledge score is above 73.734 is considered to have a high level of knowledge. A tribal farmer having score in between 29.642 and 73.734 is considered to have a medium level of knowledge about the improved agricultural practices.

Table 6. Distribution of respondents along their extent of knowledge about the improved agricultural practices

Knowledge score	Category	Frequency	Percentage
Below 29.642	Low level	20	18.18
Between 29.642 and 73.734	Medium level	69	62.73
Above 73.734	High level	21	19.09
Total		110	100.00

$\bar{X}$ = 51.688 SE = 22.046

An appraisal of Table 6 revealed that only 18.18 per cent had a low level of knowledge about the improved agricultural practices whereas majority of the tribal farmers (62.73 per cent) had a medium level of knowledge. Only 19.09 per cent of tribal farmers had a high level of knowledge. It is diagrammatically presented in Figure 3.

II. Attitude of Tribal farmers towards Farming

The attitude scores of the tribal farmers towards farming, for the sample have been given in Table 7. The tribal farmers could be categorised into three, viz. low, medium and high attitude groups based on Mean and SD. A tribal farmer with an attitude score below 16.458 is considered to have a low level of attitude towards farming, whereas one whose attitude score is above 25.942 is considered to have a high level of attitude towards farming. A tribal farmer having scores in between 16.458 and 25.942 is considered to have a medium level of attitude towards farming.

FIG 3. DIAGRAM SHOWING THE EXTENT OF KNOWLEDGE ABOUT IMPROVED AGRICULTURAL PRACTICES AND THE LEVEL OF ATTITUDE TOWARDS FARMING BY THE TRIBAL FARMERS OF THE STUDY AREA.

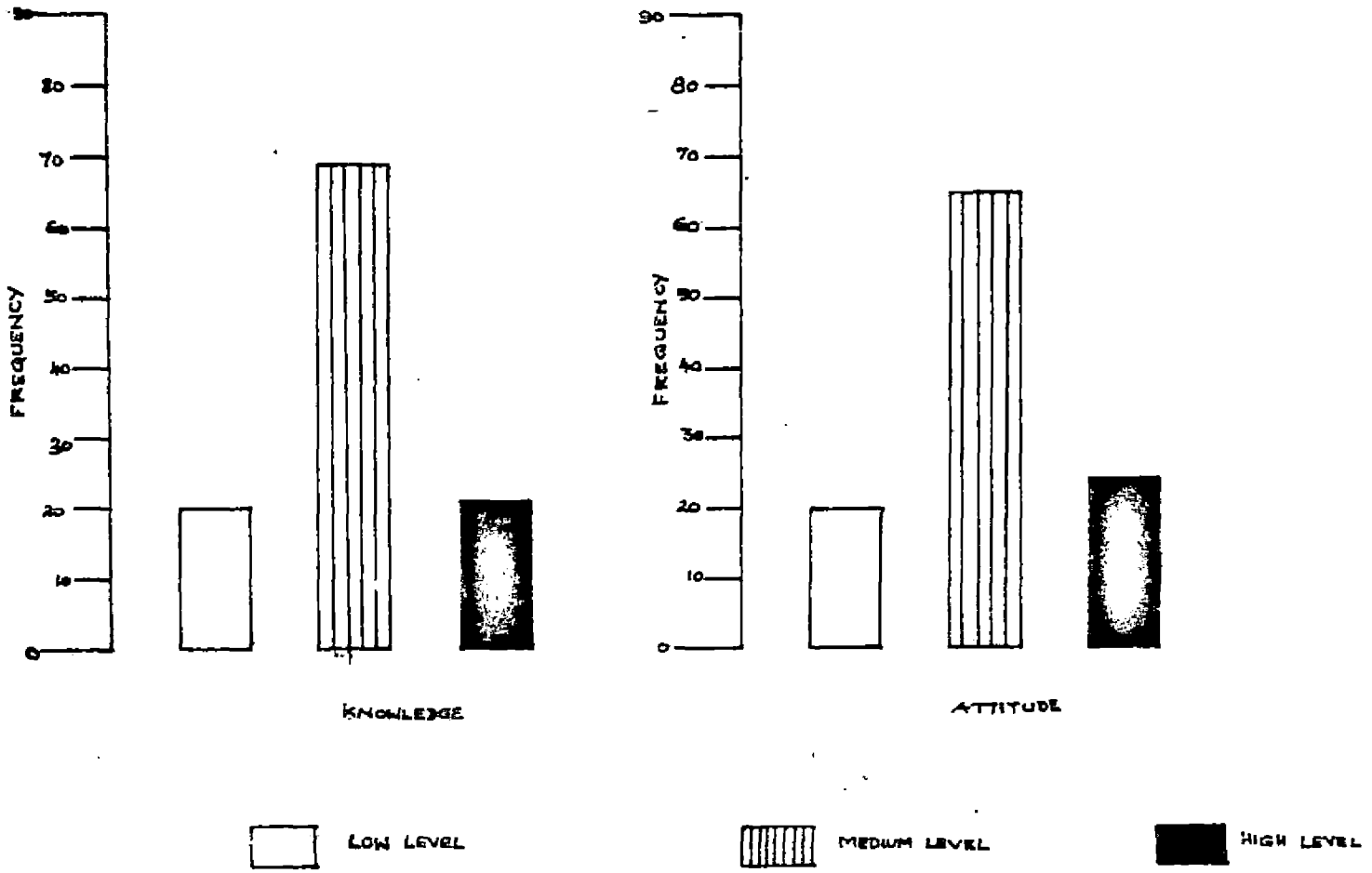


Table 7. Distribution of respondents along their attitude towards farming

Attitude score	Category	Frequency	Percentage
Below 16.458	Low	20	18.18
Between 16.458 and 25.942	Medium	66	60.00
Above 25.942	High	24	21.82
Total		110	100.00

$\bar{X}$ = 21.200 SE = 4.742

Table 7 revealed that only 18.18 per cent had a low level of attitude towards farming, whereas 21.82 per cent had a high level of attitude towards farming. Majority of the tribal farmers (60 per cent) had a medium level of attitude towards farming. This is depicted in Figure 3.

III. Extent of Adoption of Improved Agricultural Practices by the Tribal Farmers

The adoption scores of the tribal farmers in the improved agricultural practices are given in Table 8.1. A tribal farmer with an adoption score of zero is considered to be a non-adopter. If the adoption score is two or below, but greater than zero, the farmer is considered to have a low level of adoption. If the adoption score is between three and four he is considered to have a medium

level of adoption. A farmer who has an adoption score greater than four is considered to have a high level of adoption.

Table 8.1. Distribution of respondents along the extent of adoption of improved agricultural practices

Adoption score	Category	Frequency	Percentage
0	Non-adopters	09	8.18
1	Low adopters	41	56.36
2		21	
3	Medium adopters	13	30.00
4		20	
5	High adopters	04	5.46
6		02	
Total		110	100.00

Table 8.1 revealed that 8.18 per cent of the tribal farmers were non-adopters. Majority (56.36 per cent) of the tribal farmers were low adopters while 30 per cent of them were medium adopters. Only 5.46 per cent of the tribal farmers belonged to the high adopter category. This is presented in Figure 4.

FIG. 4. EXTENT OF ADOPTION OF IMPROVED AGRICULTURAL PRACTICES BY THE TRIBAL FARMERS.

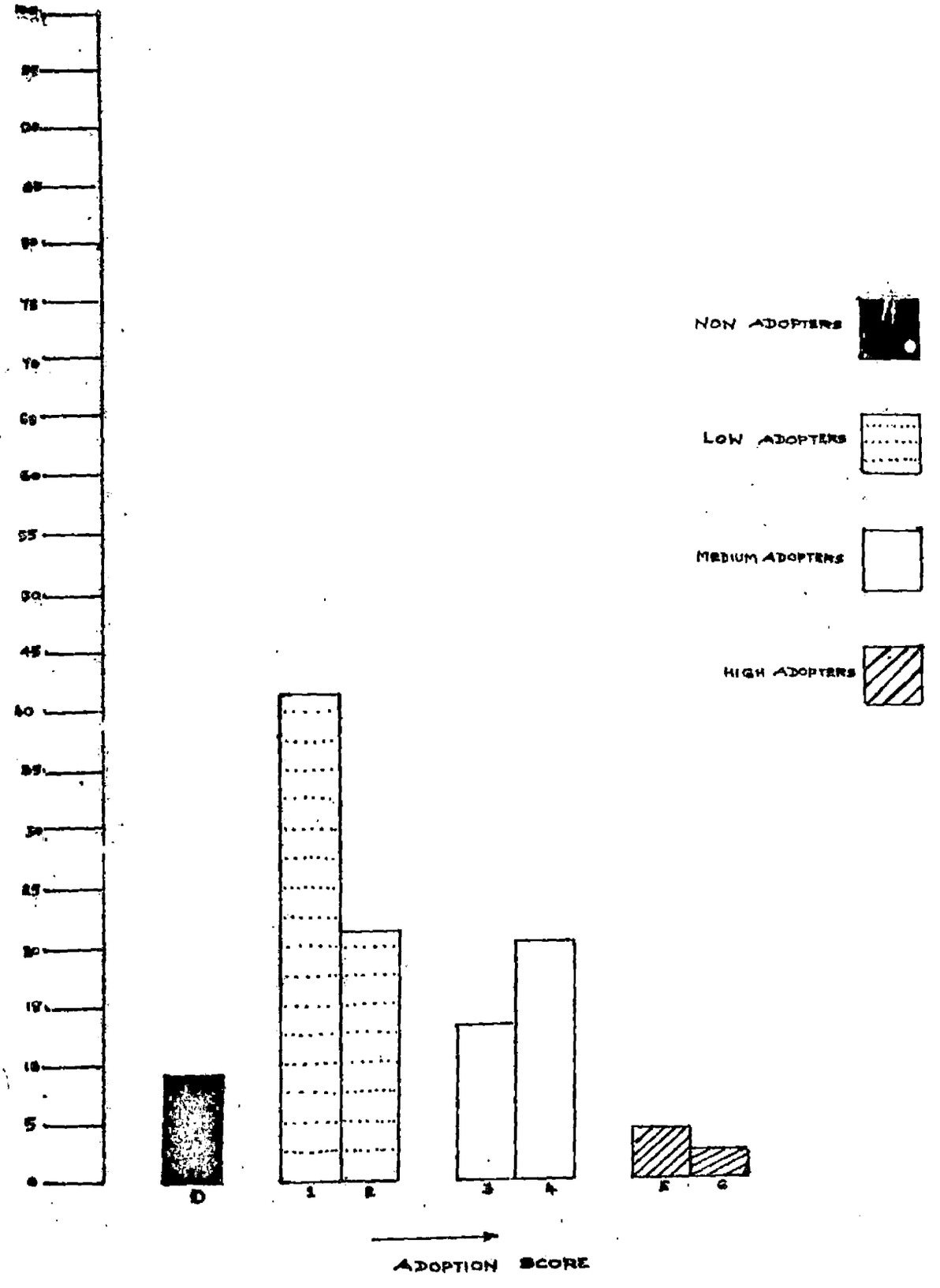


Table 8.2 Distribution of respondents along the adoption of individual practices

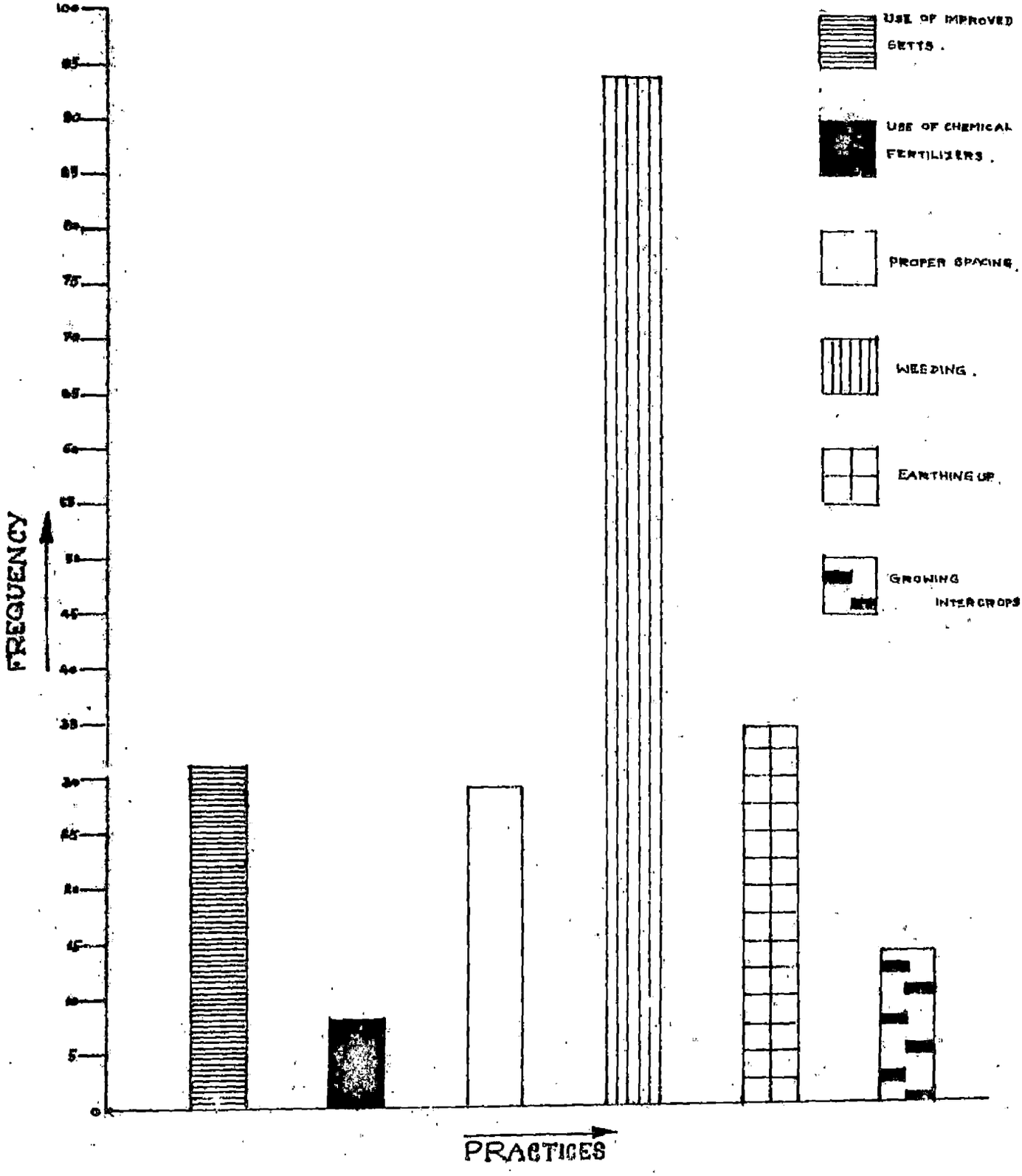
Sl. No.	Improved agricultural practices	Frequency	Percentage*
1.	Using improved setts for cultivation	31	28.18
2.	Using chemical fertilizers	08	7.27
3.	Using proper spacing	29	26.36
4.	Use of intercultural operations like		
	(a) weeding	94	85.46
	(b) earthing up	37	33.64
5.	Growing intercrops	14	12.73

* The percentages do not add upto 100 since a respondent comes in more than one category.

The extent of adoption of the individual practices is given in Table 8.2 and diagrammatically presented in Figure 5.

Table 8.2 revealed that only eight farmers used chemical fertilizers (7.27 per cent). Growing of intercrops was not adopted by the majority of farmers as only 14 were the adopters of this practice (12.73 per cent). Twenty nine farmers adopted proper spacing in tapioca cultivation (26.36 per cent), and 31 farmers used improved setts (28.18 per cent). Majority of the farmers (94) adopted weeding (85.46 per cent) and 37 farmers practised earthing up (33.64 per cent).

FIG. 5. EXTENT OF ADOPTION OF THE INDIVIDUAL PRACTICES BY THE TRIBAL FARMERS.



IV. Correlation Analysis between the Independent variables and the Dependent variables

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

A. Correlation between the extent of knowledge about Improved Agricultural Practices and the Independent variables

The result of the zero-order correlation between the extent of knowledge about improved agricultural practices and the independent variables is given in Table 9 and diagrammatically presented in Figure 6.

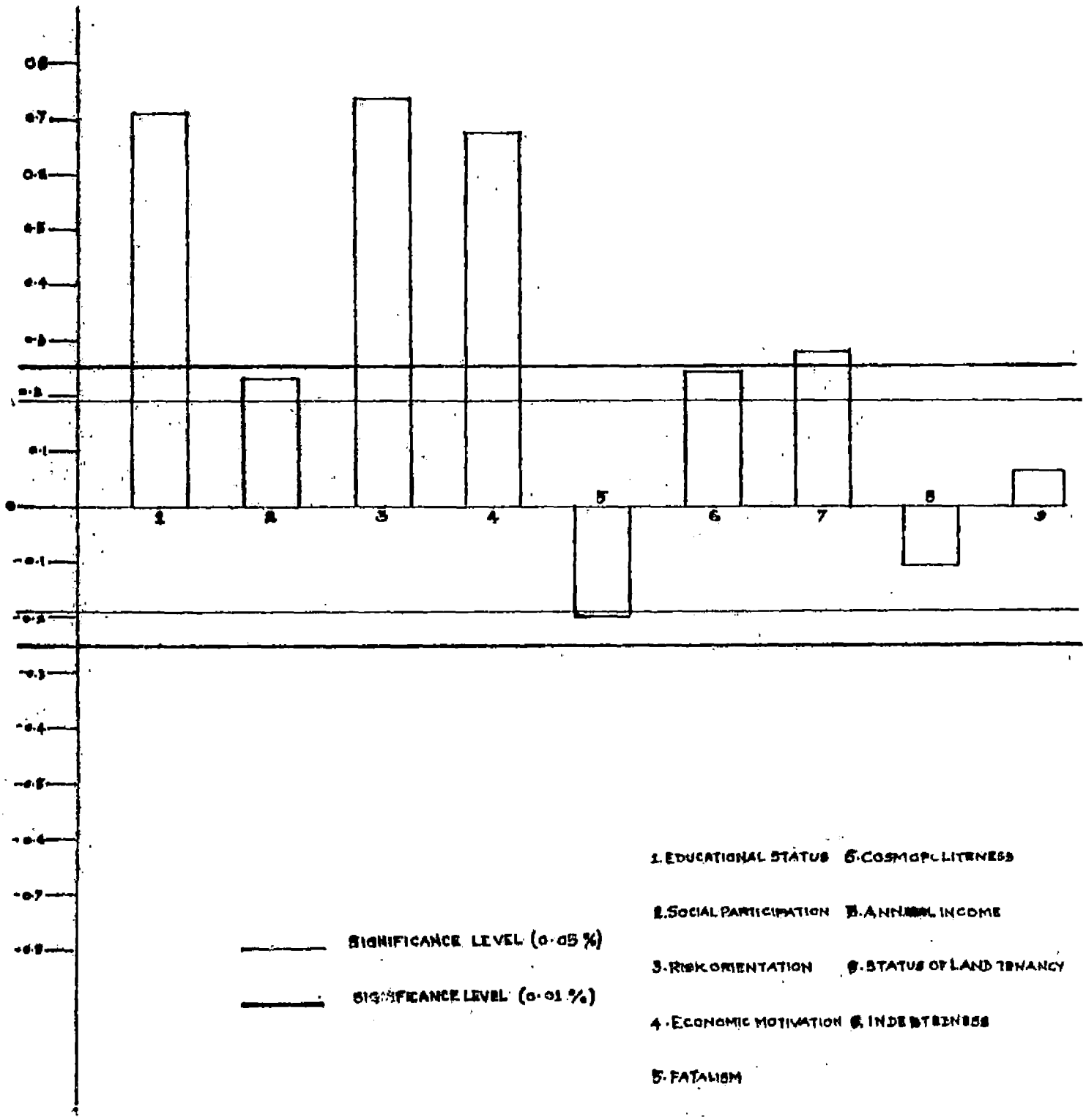
Table 9. Correlation between the extent of knowledge about improved agricultural practices and the independent variables

Variable No.	Independent variables	Zero-order correlation (N = 110)
X_1	Educational status	0.7143**
X_2	Social participation	0.2335*
X_3	Risk orientation	0.7427**
X_4	Economic motivation	0.6790**
X_5	Fatalism	-0.2019*
X_6	Cosmopoliteness	0.2461*
X_7	Annual income	0.2842**
X_8	Status of land tenancy	-0.1090
X_9	Indebtedness	0.0653

* Significant at 5 per cent level of probability

** Significant at 1 per cent level of probability

FIG. 6. CORRELATION BETWEEN THE SELECTED INDEPENDENT VARIABLES AND THE EXTENT OF KNOWLEDGE ABOUT IMPROVED AGRICULTURAL PRACTICES.



The results given in Table 9 indicated that the variables educational status, risk orientation, economic motivation and annual income were positively and significantly correlated with the extent of knowledge about improved agricultural practices at one per cent level of probability. Social participation and cosmopoliteness were positively and significantly correlated with the extent of knowledge, while fatalism was significantly, but negatively correlated with the extent of knowledge at 5 per cent level of probability. Status of land tenancy and indebtedness were not found to have significant correlation with the extent of knowledge about improved agricultural practices.

B. Correlation between Attitude towards farming and the Independent variables

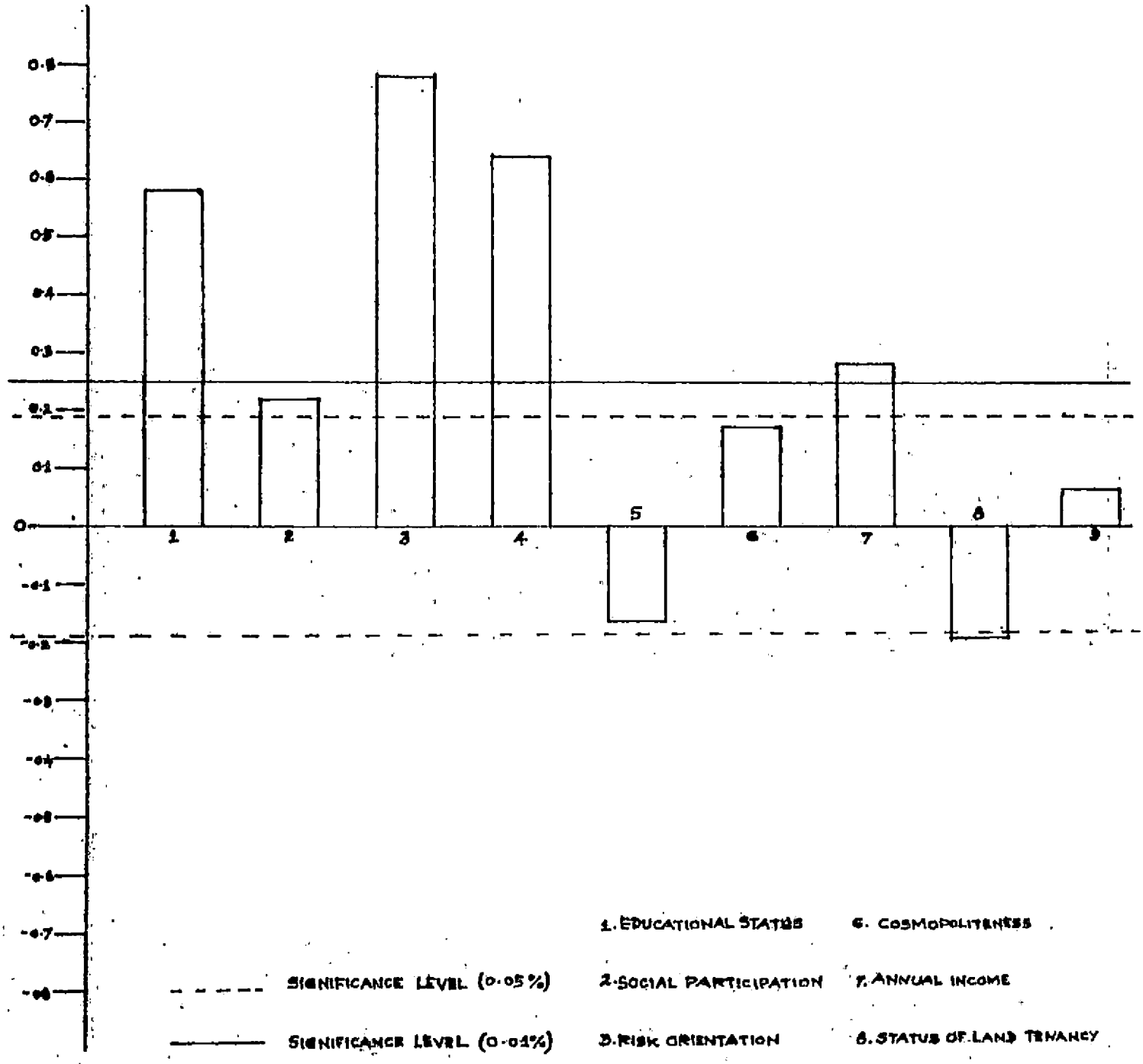
The zero-order correlation of the attitude towards farming with the independent variable is given in Table 10. It is diagramattically presented in Figure 7.

Table 10. Correlation between attitude towards farming and the independent variables

Variable	Indpendent variables	Zero-order correlations (N = 110)
X_1	Educational status	0.5846**
X_2	Social participation	0.2278*
X_3	Risk orientation	0.7812**
X_4	Economic motivation	0.6453**
X_5	Fatalism	-0.1758
X_6	Cosmopoliteness	0.1773
X_7	Annual income	0.2825**
X_8	Status of land tenancy	-0.1997*
X_9	Indebtedness	0.0671

* Significant at 5 per cent level of probability.
** Significant at 1 per cent level of probability.

FIG. 7. CORRELATION BETWEEN THE SELECTED INDEPENDENT VARIABLES AND THE ATTITUDE TOWARDS FARMING.

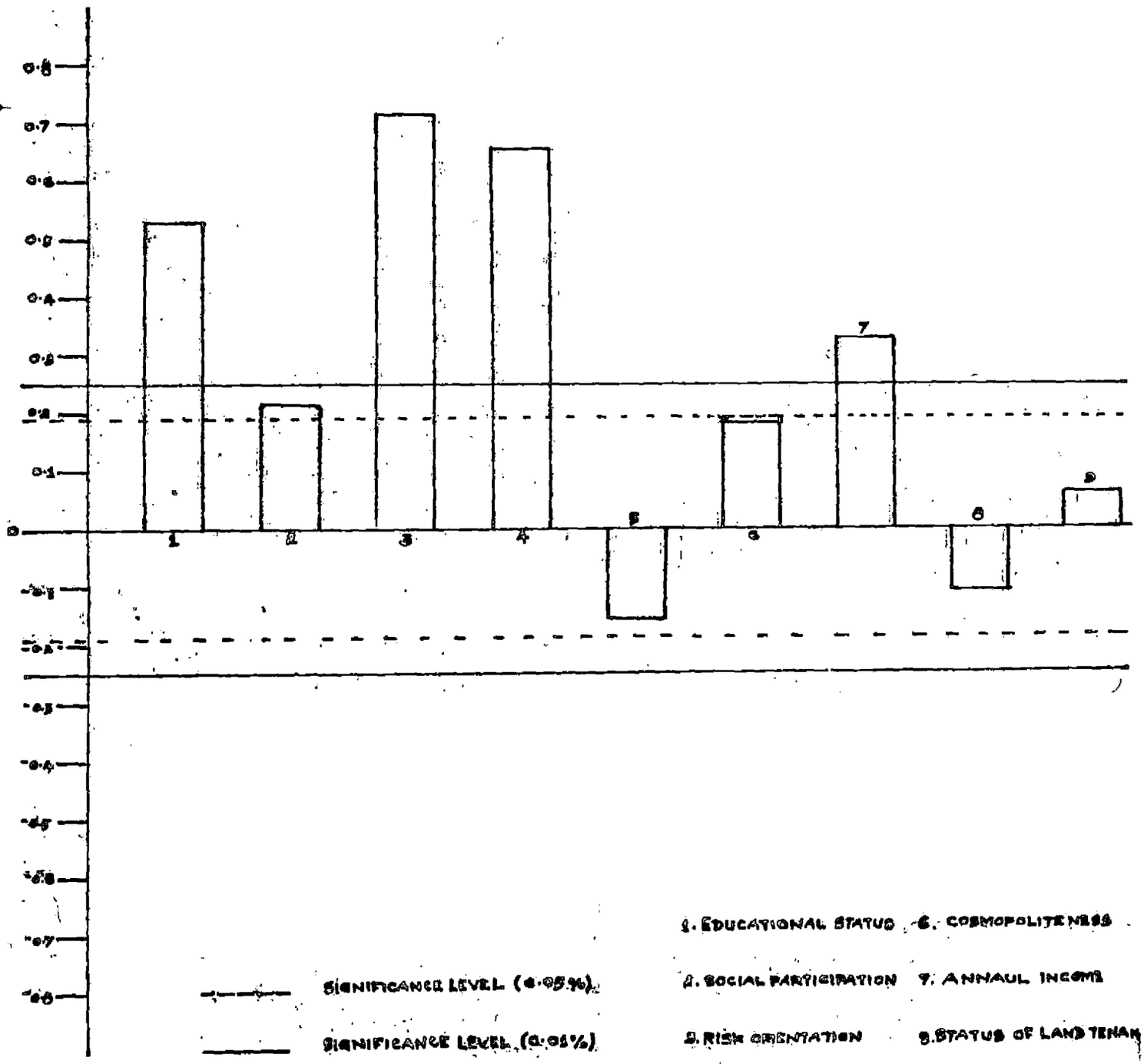


The table 10 indicated that educational status, risk orientation, economic motivation and annual income were positively and significantly correlated with attitude towards farming at 1 per cent level of probability. Social participation was positive and significantly correlated with attitude towards farming, while status of land tenancy was negatively and significantly correlated at 5 per cent level of probability. Fatalism, cosmopoliteness and indebtedness were not found to have significant correlation with attitude towards farming.

C. Correlation between the extent of adoption of improved agricultural Practices and the Independent variables

The Zero-order correlation of the extent of adoption of improved agricultural practices with the independent variables is presented in Table 11 and also diagramatically in Figure 3.

FIG. 8. CORRELATION BETWEEN THE SELECTED INDEPENDENT VARIABLES AND THE EXTENT OF ADOPTION OF IMPROVED AGRICULTURAL PRACTICES.



SIGNIFICANCE LEVEL (0·05%).

SIGNIFICANCE LEVEL (0·01%)

1. EDUCATIONAL STATUS
2. SOCIAL PARTICIPATION
3. RISK ORIENTATION
4. ECONOMIC MOTIVATION
5. FATALISM
6. COSMOPOLITENESS
7. ANNAUL INCOME
8. STATUS OF LAND TENAN
9. INDEBTEDNESS

Table 11. Correlation between the extent of adoption of improved agricultural practices and the independent variables

Variable No.	Independent variables	Zero-order correlation (N = 110)
X_1	Educational status	0.5362**
X_2	Social participation	0.2131*
X_3	Risk orientation	0.7156**
X_4	Economic motivation	0.6688**
X_5	Fatalism	-0.1696
X_6	Cosmopoliteness	0.1916
X_7	Annual income	0.3357**
X_8	Status of land tenancy	-0.1111
X_9	Indebtedness	0.0642

* Significant at 5 per cent level of probability
** Significant at 1 per cent level of probability

The results presented in table 11 indicated that educational status, risk orientation, economic motivation and annual income were significantly and positively correlated with the extent of adoption of improved agricultural practices at 1 per cent level of probability. Social participation was significantly and positively correlated with the extent of adoption at 5 per cent level of probability. Fatalism, cosmopoliteness, status of land tenancy and indebtedness were not found to have significant correlation with the extent of adoption of improved agricultural practices.

V. Relative importance of the selected characteristics and their contribution in explaining the dependent variables

Simple correlation was useful only to find the association between the variables. Besides, an attempt was also made to know the relative importance of the different independent variables in explaining each of the dependent variables, viz. extent of knowledge about improved agricultural practices, attitude towards farming and extent of adoption of improved agricultural practices. The technique of stepwise multiple regression analysis would be useful to know the relative effect of the independent variables in predicting each of the dependent variable and elimination of unimportant variables at each step. By doing this analysis, it would also be possible to know how the addition of variables behaves in explaining the variation of the dependent variable at each stage.

A. Stepwise multiple Regression analysis of the extent of knowledge about Improved Agricultural Practices with the Independent variables

The results of the regression analysis has been presented in Table 12.1 and 12.2.

Table 12.1. Results of the stepwise Multiple regression analysis showing all the significant steps, of the Extent of Knowledge about Improved Agricultural Practices with the independent variables

Step number	Variables included in the regression analysis	M.C.C.*	M.C.C. adjusted for d.f.	D.F.	F. ratio
1	X_3	0.7427	0.7427	1,108	132.86
2	X_3 X_1	0.8450	0.8434	2,107	133.58
3	X_3 X_1 X_9	0.8527	0.8497	3.106	94.17
4	X_3 X_1 X_9 X_2	0.8561	0.8517	4,105	72.04
5	X_3, X_1 X_9 X_2 X_4	0.8594	0.8536	5,104	58.78

* M.C.C. - Multiple Correlation Coefficient.

Table 12.2. Results of the step-wise Multiple Regression Analysis showing the final significant step (Step No.5) with all significant variables included in the study of the extent of knowledge about improved agricultural practices (N = 110)

Variable number	Name of the variable	Regression coefficient(b)	S.E. of 'b'	't' value
X_3	Risk orientation	2.6533	0.3883	6.833*
X_1	Educational Status	4.8219	0.7622	6.327*
X_9	Indebtedness	-3.4492	1.2749	-2.705*
X_2	Social participation	0.6262	0.4031	1.553
X_4	Economic motivation	1.4135	0.9384	1.506

R^2 = 0.7386 F = 58.78 * Significant at 5 per cent level of probability

R^2 at the end of 9th step = 0.7434

From Table 12.1 it could be observed that risk orientation (X_3) was the most important variable in explaining the variation in the extent of knowledge about improved agricultural practices, as more than 55 per cent of the variation could be explained by this single variable. A perusal of the table revealed that the predictive power of the regression equation increased with each additional step. Step number 5 which included 5 variables gave the maximum R^2 value with an F value of 58.78 which indicated that the predictive power was highest at this step. Seventythree per cent of the variation was explained by all these 5 variables.

All the 9 variables taken for the step-wise multiple regression analysis jointly explained 74 per cent of the variation in the extent of knowledge about improved agricultural practices, whereas the 5 variables taken upto the cutting point alone contributed to 73 per cent of the variation. In other words, contribution of variables other than the 5 variables was not significant in predicting the dependent variable.

At the 5th step, the F-value of 58.78 was found to be significant indicating that the regression equation with all the 5 variables included was significant in prediction.

The result of the final significant regression equation at step No.5 is presented in Table 12.2. Eventhough all the 5 variables collectively were significant in prediction as indicated by the F value, only coefficients of certain variables were found to be significant by their 't' values. The table indicated that the variables risk orientation, educational status, and indebtedness were individually significant in the prediction.

The regression equation given below was significant in predicting the extent of knowledge about improved agricultural practices of the tribal farmers.

$$Y = -23.2450 + 2.6533\ X_3^* + 4.8219\ X_1^* - 3.4492\ X_9^* + 0.6262\ X_2 + 1.4135\ X_4$$

The partial regression coefficient indicated that an unit increase in risk orientation would result in the increase of 2.6533 units of extent of knowledge, cetaris paribus. Similarly with an unit increase in educational status, there would be increase of 4.8219 units in the extent of knowledge about improved agricultural practices, other factors being kept constant. An unit increase in indebtedness would cause a decrease of 3.4492 units in the extent of knowledge cetaris paribus.

B. Step-wise Multiple Regression Analysis of the Attitude towards Farming with the Independent variables

The results of the regression analysis are presented in Table 13.1 and 13.2.

From Table 13.1 it could be observed that risk-orientation (X_3) was the most important variable in explaining the variation in the attitude towards farming, as more than 61 per cent of the variation could be explained by this single variable. Step No.7 which included 7 variables gave the maximum R^2 value with an F value of 33.35, which indicated that the predictive power was highest at this step. 69.5 per cent of the variation was explained by these 7 variables together.

All the 9 variables taken for the step-wise regression analysis jointly explained 69.6 per cent of the variation in the attitude towards farming, whereas the 7 variables taken up to the cutting point alone contributed to 69.5 per cent of the variation. In other words, contribution of the other variables given after the 7th step was not significant in predicting the dependent variable. At the 7th step, the F-value of 33.35 was found to be significant indicating that the regression equation with all the 7 variables included was significant in prediction.

Table 13.1. Results of step-wise Multiple Regression Analysis showing all the significant steps of the attitude towards farming with the independent variables

Step Number	variables included in the regression analysis	M.C.C.*	M.C.C. adjusted for d.f.	D.F.	F ratio
1	X_3	0.7812	0.7812	1,108	169.11
2	X_3 X_1	0.8152	0.8133	2,107	105.96
3	X_3 X_1 X_9	0.8203	0.8166	3,106	72.68
4	X_3 X_1 X_9 X_7	0.8276	0.8221	4,105	57.04
5	X_3 X_1 X_9 X_7 X_2	0.8298	0.8226	5,104	45.98
6	X_3 X_1 X_9 X_7 X_2 X_4	0.8322	0.8233	6,103	38.67
7	X_3 X_1 X_9 X_7 X_2 X_4 X_8	0.8342	0.8236	7,102	33.35

* M.C.C. Multiple Correlation Coefficient

Table 13.2. Result of the step-wise Multiple Regression Analysis showing the final significant step (Step No.7) with all significant variables included in the study of the Attitude towards farming

Variable Number	Name of the variable	Regression coefficient(b)	S.E. of 'b'	't' value
X_3	Risk orientation	0.7283	0.0930	7.835*
X_1	Educational status	0.4929	0.1807	2.728*
X_9	Indebtedness	-0.8661	0.3317	-2.611*
X_7	Annual income	0.5792	0.3321	1.744
X_2	Social participation	0.1112	0.0951	1.169
X_4	Economic motivation	0.2612	0.2245	1.163
X_5	Status of land ownership	-1.7858	1.6686	-1.070

R^2 = 0.6959 F = 33.35 * Significant at 5 per cent level of probability

R2 at the end of 9^{th} step = 0.6961.

The result of the final significant regression equation at step No.7 has been presented in Table 13.2. It was revealed that though all the 7 variables collectively were significant in explaining the behaviour of the dependent variable as is evident from the *F* values, only the co-efficients of 3 variables viz. risk orientation, educational status and indebtedness were significant by their 't' values.

The prediction equation used in the present case was

$$Y = 2.1632 + 0.7288 X_3^* + 0.4929 X_1^* - 0.8661 X_9^* + 0.5792 X_7 + 0.1112 X_2 + 0.2612 X_4 - 1.7858 X_8$$

The partial regression coefficient indicated that an unit increase in risk orientation (X_3) resulted in an increase of 0.7288 unit in attitude towards farming, other factors being kept constant. For an unit increase in educational status (X_1) there would be 0.4929 increase in the attitude towards farming. But an unit increase in indebtedness (X_9) resulted in a decrease of 0.8661 unit of attitude towards farming.

C. Step-wise Multiple Regression Analysis of the Extent of Adoption of Improved Agricultural Practices with the Independent variables

The results of the regression analysis are presented in Table 14.1 and 14.2.

Table 14.1. Results of the step-wise Multiple Regression Analysis showing all the significant steps of the extent of adoption of improved agricultural practices with the independent variables

Step number	Variables included in the regression analysis	M.C.C.*	M.C.C. adjusted for d.f.	D.F.	F ratio
1	X_3	0.7156	0.7156	1,108	113.35
2	X_3 X_4	0.7621	0.7595	2,107	74.12
3	X_3 X_4 X_9	0.7709	0.7659	3,106	51.75
4	X_3 X_4 X_9 X_7	0.7893	0.7826	4.105	43.39
5	X_3 X_4 X_9 X_7 X_1	0.7923	0.7833	5.104	35.08

* M.C.C. Multiple Correlation Coefficient.

Table 14.2. Result of the step-wise regression analysis showing the final significant step (Step No.5) with all significant variables included in the study of the extent of adoption of improved agricultural practices (n = 110)

Variable number	Name of the variable	Regression coefficient(b)	S.E. of b	't' value
X_3	Risk orientation	0.1868	0.0307	6.077*
X_4	Economic motivation	0.2051	0.0759	2.701*
X_9	Indebtedness	-0.3304	0.1121	-2.948*
X_7	Annual income	0.2888	0.1102	2.620*
X_1	Educational Status	0.0701	0.0611	1.147

R^2 = 0.6277 F = 35.08 * Significant at 5 per cent level of probability

R^2 at the end of 9^{th} step = 0.6315

Table 14.1 revealed that risk orientation (X_3) was the most important variable in explaining the variation in the extent of adoption of improved agricultural practices. Fiftyone per cent of the variation was contributed by this single variable alone. Step No.5 which included 5 variables gave the maximum R^2 value with an F- value of 35.08 which indicated that the predictive power was highest at this step.

All the 9 variables taken for the step-wise regression analysis jointly explained 63 per cent of the variation in the extent of adoption, whereas the 5 variables taken up to the cutting point alone contributed to 62.8 per cent of the variation. In other words, contribution of the other variables given after the 5th step was not significant in predicting the dependent variable. At the 5th step, the F value of 35.08 was found to be significant, indicating that the regression equation with all the 5 variables included was significant in prediction.

The result of the final significant regression equation at step No.5 has been presented in Table 14.2. The table revealed that though all the 5 variables collectively were significant in explaining the behaviour of the dependent variable, as is evident from the F values, only the co-efficients of the variables risk orientation,

economic motivation, indebtedness and annual income were significant by their 't ' values.

The prediction equation used in the present case was

$$Y = 3.2748 + 0.1868 X_3^* + 0.2050 X_4^* - 0.3304 X_9^* + 0.2888 X_7^* - 0.0701 X_1$$

The partial regression indicated that an unit increase in risk orientation (X_3) resulted in an increase of 0.1868 unit of adoption, other factors being kept constant. For an unit increase in economic motivation (X_4), there would be 0.2050 increase in the extent of adoption of improved agricultural practices. But with an unit increase in indebtedness (X_9) there would be 0.3304 decrease in the extent of adoption. An unit increase in annual income (X_7) resulted in an increase of 0.2888 unit of adoption, other factors being kept constant.

VI. Direct and indirect effects of the Independent variables on the Dependent variables

From the results of the step-wise regression analyses, it could be seen that the number of significant variables included in the regression analysis in the case of the extent of knowledge about improved agricultural practices, attitude towards farming, and the extent of adoption of improved agricultural practices were not uniformly the same.

It could be seen that the variables which were significant ranged from 5 to 7. Only these significant variables from each of the step-wise regression analysis were selected for path analysis.

Path co-efficient, according to Li (1954) is an absolute number without any physical unit, what ever be the actual units of measurements for the variables. It has also direction. Through path analysis, it is possible to have a clear picture of the direct and indirect effects of the selected independent variables on the dependent variable. The variables through which substantial indirect effects were channelled could also be traced.

A. Direct and Indirect effects of the Independent variables on the extent of knowledge about Improved Agricultural Practices

The five variables which were considered for studying their direct and indirect effects on the extent of knowledge about improved agricultural practices are presented in Table 15.1.

Table 15.2 presents the direct and indirect effects of all the 5 variables selected for analysis.

A perusal of Table 15.2 indicated that the independent variable, risk orientation had the highest substantial direct effect (0.4728) on extent of knowledge. The total

Table 15.1. List of selected independent variables taken to study the Direct and Indirect effects on the extent of knowledge about improved agricultural practices

Serial number	Variable number	Name of the variable
1	X_3	Risk orientation
2	X_1	Educational status
3	X_9	Indebtedness
4	X_2	Social participation
5	X_4	Economic motivation

Table 15.2. Direct and indirect effects of the independent variables on the extent of knowledge about improved agricultural practices

X_3	X_1	X_9	X_2	X_4	Total indirect effect	Total correlation with Y
<u>0.4728</u>	0.2137	-0.0215	0.0155	0.0622	0.2699	0.7427
0.2308	<u>0.4377</u>	-0.0295	0.0126	0.0627	0.2766	0.7143
0.0728	0.0924	<u>-0.1396</u>	0.0125	0.0272	0.2049	0.0653
0.0918	0.0691	-0.0219	<u>0.0798</u>	0.0147	0.1537	0.2335
0.3117	0.2905	-0.0402	0.0124	<u>0.0944</u>	0.5744	0.6688

Residual = 0.5134

Table 15.3. Substantial effect of the independent variables on the extent of knowledge about improved agricultural practices

Variable number	Name of the variable	Direct effect	Total indirect effect	Substantial effect through the curcial variables according to the rank		
				First	Second	Third
X_3	Risk orientation	0.4728	0.2699	0.2137 X_1	0.0622 X_4	-
X_1	Educational status	0.4377	0.2766	0.2308 X_3	0.0627 X_4	-
X_9	Indebtedness	-0.1396	0.2049	0.0924 X_1	0.0728 X_3	-
X_2	Social participation	0.0798	0.1537	0.0918 X_3	0.0691 X_1	-
X_4	Economic motivation	0.0944	0.5744	0.3117 X_3	0.2905 X_1	-

(Residual 0.5134)

Out of 10 substantial indirect effects, 4 were routed through X_1, 4 were routed through X_3 and 2 were routed through X_4.

indirect effects ranged from 0.1537 in the case of social participation to 0.5744 in the case of ecnomic motivation.

Table 15.3 presents the substantial direct and indirect effects through the crucial variables. Figure 9 depicts the direct and indirect effects diagramatically.

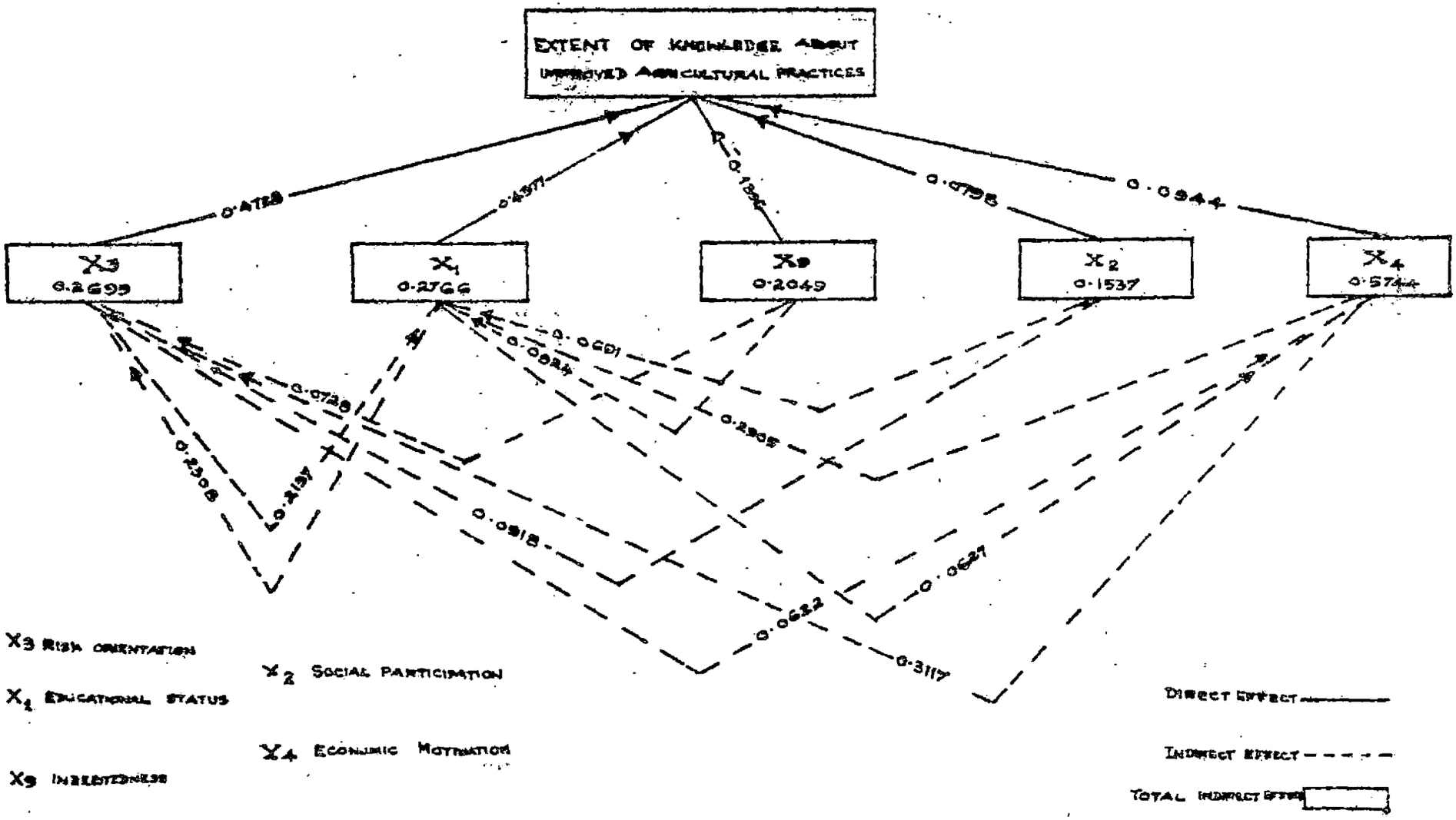
X_3 Risk orientation

The direct effect of risk orientation on the extent of knowledge about improved agricultural practices was positive and substantial (0.4728) which indicated that risk orientation had high direct effect on extent of knowledge about improved agricultural practices. The total indirect effect of risk orientation (0.2699) was also positive and substantial. The indirect effect was mostly channelled through educational status (X_1) and economic motivation (X_4) as could be observed from Table 15.3.

X_2 Educational Status

The direct effect of educational status on the extent of knowledge about improved agricultural practices was positive and substantial (0.4377). The total indirect effect of this variable (0.2766) was also positive and substantial. The indirect effect was mostly chanelled through risk orientation (X_3) and economic motivation (X_4).

FIG. 9. PATH ANALYSIS SHOWING THE DIRECT AND INDIRECT EFFECTS OF THE SELECTED INDEPENDENT VARIABLES ON EXTENT OF KNOWLEDGE ABOUT IMPROVED AGRICULTURAL PRACTICES.



X_9 Indebtedness

The direct effect of indebtedness on extent of knowledge was negative and substantial (-0.1396). The total indirect effect of this variable was positive and substantial (0.2049). The indirect effect of this variable was mostly channelled through educational status (X_1) and risk orientation (X_3).

X_2 Social Participation

The direct effect of this variable on extent of knowledge about improved agricultural practices and the total indirect effect towards the extent of knowledge were 0.07988 and 0.1537 respectively both being positive and substantial. The indirect effect of this variable through risk orientation (X_3) itself was 0.0918, which exceeded the direct effect. The indirect effects were mostly channelled through risk orientation (X_3) and educational status (X_1).

X_4 Economic Motivation

The direct effect and the total indirect effect of this variable on the extent of knowledge about improved agricultural practices were 0.0944 and 0.5744 respectively, both being positive and substantial. The indirect effects of this variable were mostly channelled through risk-

orientation (X_3) and educational status (X_1), both of which exceeded the direct effect.

B. Direct and Indirect effects of the Independent variables on Attitude towards Farming

The seven variables selected to study the direct and indirect effects on attitude towards farming are presented in Table 16.1.

Table 16.2 presents the direct and indirect effects of all the seven variables selected for the path analysis.

The results revealed that the highest direct effect towards the dependent variable was due to the variable risk orientation (X_3) followed by educational status (X_1). The total indirect effects varied from 0.5422 in the case of economic motivation to -0.1459 in the case of status of land tenancy.

Table 16.3 depicts the substantial direct and indirect effects through the crucial variables. Figure 10 gives a diagramatic presentation of the direct and indirect effects of the independent variables. The variable wise results are presented below.

X_3 Risk orientation

The highest direct effect of risk orientation (X_3) being 0.6114 revealed the importance of this variable in

Table 16.1. List of selected Independent variables taken to study the Direct and indirect effects on the attitude towards farming

Serial number	Variable number	Name of the variable
1	X_3	Risk orientation
2	X_1	Educational Status
3	X_9	Indebtedness
4	X_7	Annual income
5	X_2	Social participation
6	X_4	Economic motivation
7	X_8	Status of land tenancy

Table 16.2. Direct and indirect effects of the Independent variables on the attitude towards Farming

X_3	X_1	X_9	X_7	X_2	X_4	X_8	Total indirect effect	Total correlation with Y
0.6114	0.1005	-0.0252	0.0210	0.0128	0.0680	-0.0073	0.1698	0.7812
0.2985	0.2059	-0.0346	0.0386	0.0104	0.0684	-0.0026	0.3787	0.5846
0.0942	0.0435	-0.1637	0.0523	0.0103	0.0297	+0.0008	0.2308	0.0671
0.1252	0.0774	-0.0833	0.1028	0.0133	0.0430	+0.0042	0.1798	0.2825
0.1187	0.0325	-0.0256	0.0207	0.0659	0.0160	-0.0004	0.1619	0.2278
0.4030	0.1367	-0.0471	0.0429	0.0102	0.1031	-0.0035	0.5423	0.6453
-0.1275	-0.0158	-0.0039	0.0124	-0.0008	-0.0103	0.0348	-0.1459	-0.1111

Residual = 0.5535

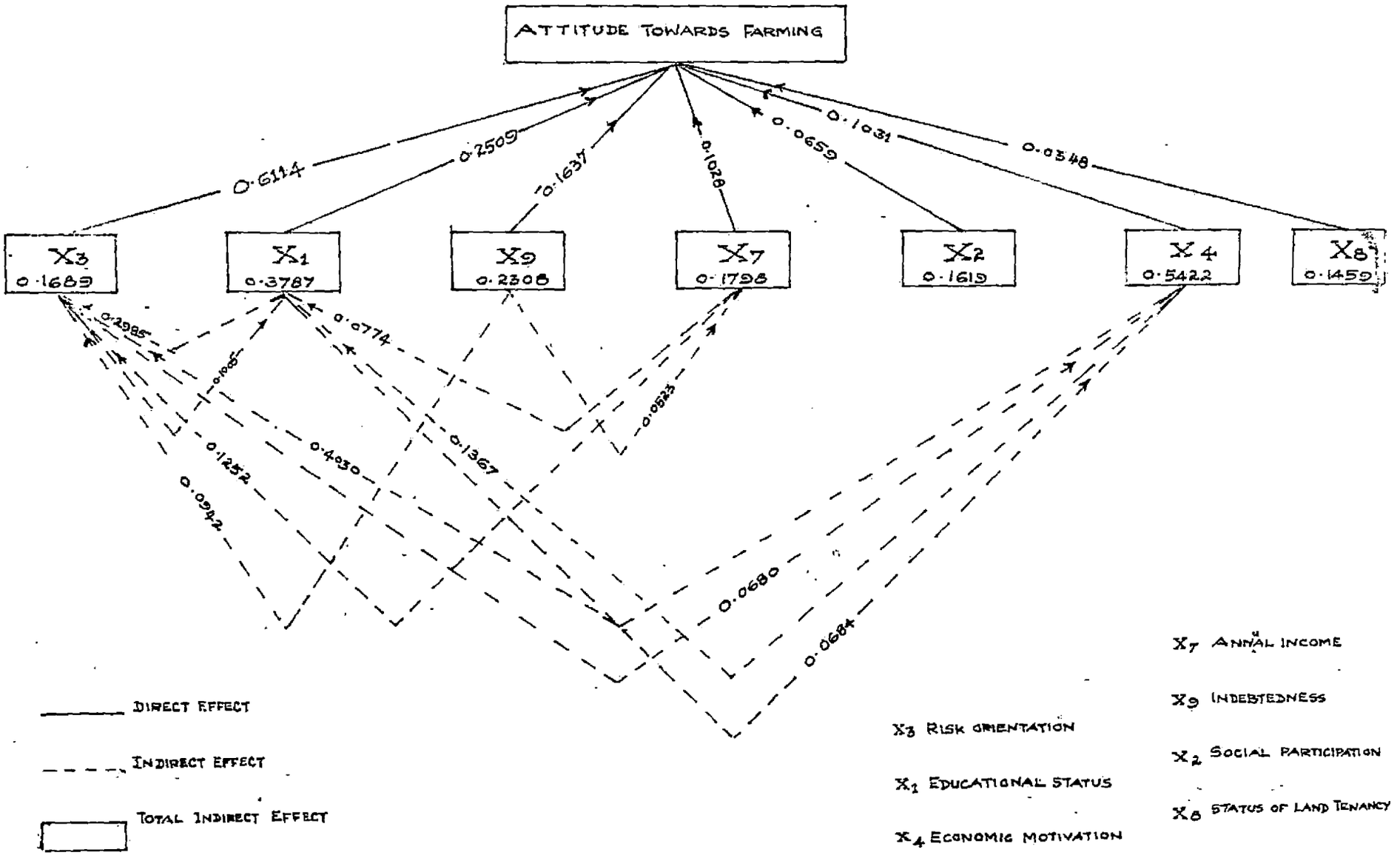
Table 16.3. Substantial effect of the independent variables on attitude towards farming

Variable number	Name of the variable	Direct effect	Total indirect effect	Substantial effect through the crucial variable according to the rank		
				First	Second	Third
X_3	Risk orientation	0.6114	0.1698	0.1005 X_1	0.0680 X_4	-
X_1	Educational status	0.2059	0.3787	0.2985 X_3	0.0684 X_4	-
X_9	Indebtedness	-0.1637	0.2308	0.0942 X_3	0.0523 X_7	-
X_7	Annual income	0.1028	0.1798	0.1252 X_3	0.0774 X_1	-
X_2	Social participation	0.0659	0.1619	0.1187 X_3	-	-
X_4	Economic motivation	0.1031	0.5422	0.4030 X_3	0.1367 X_1	-
X_8	Status of land tenancy	0.0348	-0.1459	-	-	-

Residual = 0.5535

Out of 11 substantial indirect effects, 5 were routed through X_3, 3 were routed through X_1, 2 were routed through X_4 and one through X_7.

FIG. 10 . PATH ANALYSIS SHOWING THE DIRECT AND INDIRECT EFFECTS OF SELECTED INDEPENDENT VARIABLES ON ATTITUDE TOWARDS FARMING.



determining the attitude towards farming. The total indirect effect of risk orientation was also positive and substantial. The indirect effects ware mainly routed through educational status (X_1) and economic motivation (X_4).

(X_1) Educational Status

The direct effect of this variable on the attitude towards farming was positive and substantial, the value being 0.2059. The total indirect effect was also positive but higher than the direct effect (0.3787). The indirect effect of this variable through risk orientation (X_3) was 0.2985, which itself exceeded the direct effect. The indirect effects were mainly routed through risk orientation (X_3) and economic motivation (X_4).

(X_9) Indebtedness

The direct effect of indebtedness on attitude towards farming was found to be negative and substantial (-0.1637). But the total indirect effect was positive and substantial (0.2308). The indirect effects were mainly routed through risk orientation (X_3) and annual income (X_7).

X_7 Annual income

The direct effect as well as the total indirect effect of annual income on attitude towards farming were positive and substantial, values being 0.1028 and 0.1798 respectively. The indirect effects were mostly channelled

through risk orientation (X_3) and educational status. The indirect effect of this variable through risk orientation (X_3) itself was 0.1252, which exceeded the direct effect.

X_2 Social participation

The direct and the total indirect effect of this variable on attitude towards farming were 0.0659 and 0.1619 respectively, both being relatively low in magnitude. The indirect effect was mainly routed through risk orientation (X_3) which itself exceeded the direct effect (0.1187).

X_4 Economic Motivation

The direct effect of this variable on attitude towards farming was positive and substantial (0.1031). The total indirect effect was substantial and the highest (0.5422). The indirect effects of this variable were mainly channelled through risk orientation (X_3) and educational status (X_1), both of which had exceeded the direct effect, the values being 0.4030 and 0.1367 respectively.

X_5 Status of land tenancy

The direct and total indirect effects of this variable were 0.0348 and -0.1459 respectively. It could be seen from Table 16.2. that indirect effects routed through any single variable was not substantial.

C. Direct and indirect effects of the Independent variables on the Extent of Adoption of Improved Agricultural Practices

The five variables which were considered for studying their direct and indirect effects on the extent of adoption of improved agricultural practices are presented in Table 17.1.

Table 17.2 presents the direct and indirect effects of all the five variables selected for the path analysis.

It could be seen from the Table 17.2 that the highest direct effect towards extent of adoption was due to the variable risk orientation (X_3). The total indirect effect varied from 0.1395 in the case of annual income to 0.4425 in the case of educational status.

The substantial direct and indirect effects through the crucial variables are depicted in Table 17.3. Figure 11 presents diagramatically the direct and indirect effects of the independent variables on extent of adoption. The variable-wise results are presented below.

X_3 Risk orientation

The direct and the total indirect effect of this variable were 0.4885 and 0.2267 respectively. The indirect effect was mainly routed through economic motivation (X_4).

It could be seen that the highest direct effect towards extent of adoption was due to risk orientation.

Table 17.1. List of selected independent variables taken to study the direct and indirect effects on the Adoption of Improved Agricultural Practices

Serial No.	Variable number	Name of the variable
1	X_3	Risk orientation
2	X_4	Economic motivation
3	X_9	Indebtedness
4	X_7	Annual income
5	X_1	Educational status

Table 17.2. Direct and indirect effects of the independent variables on adoption of improved Agricultural Practices by the Tribal farmers

X_3	X_4	X_9	X_7	X_1	Total indirect effect	Total correlation with Y
0.4885	0.1727	-0.0317	0.0405	0.0455	0.2271	0.7156
0.3220	0.2620	-0.0594	0.0819	0.0621	0.4068	0.6688
0.0753	0.0754	-0.2060	0.0998	0.0197	0.2702	0.0642
0.1000	0.1093	-0.1049	0.1961	0.0352	0.1396	0.3357
0.2385	0.1738	-0.0434	0.0738	0.0934	0.4428	0.5362

Residual = 06101

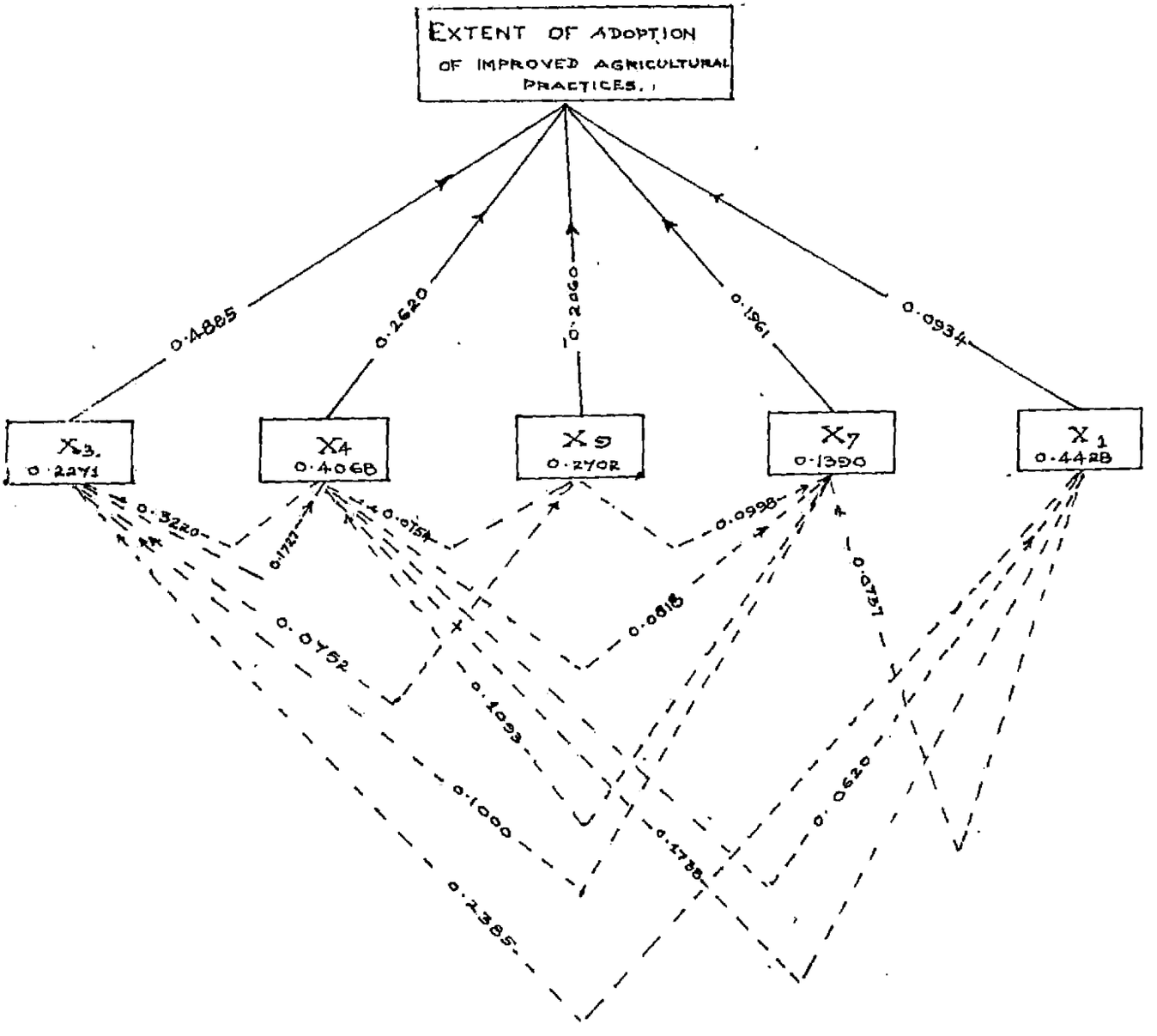
Table 17.3. Substantial effect of the Independent variables on the extent of adoption of Improved Agricultural Practices

Variable Number	Name of the variable	Direct effect	Total indirect effect	Substantial effect through the crucial variables according to the rank		
				First	Second	Third
X_3	Risk orientation	0.4885	0.2271	0.1727 X_4	-	-
X_4	Economic motivation	0.2620	0.4068	0.3220 X_3	0.0818 X_7	0.0620 X_1
X_9	Indebtedness	-0.2060	0.2702	0.0998 X_7	0.0754 X_4	0.0752 X_3
X_7	Annual income	0.1961	0.1396	0.1093 X_4	0.1000 X_3	-
X_1	Educational status	0.0934	0.4428	0.2385 X_3	0.1738 X_4	0.0737 X_7

(Residual 0.6101)

Out of 12 substantial indirect effects, 4 were routed through X_4, 4 were routed through X_3, 3 were routed through X_7 and one was routed through X_1.

FIG. 11. PATH ANALYSIS SHOWING THE DIRECT AND INDIRECT EFFECTS OF THE SELECTED INDEPENDENT VARIABLES ON EXTENT OF ADOPTION OF 'IMPROVED' AGRICULTURAL PRACTICES.



The substantial indirect effect of risk orientation through economic motivation revealed the importance of this variable in determining the extent of adoption.

X_4 Economic motivation

The direct and the total indirect effect of economic motivation were 0.2620 and 0.4068 respectively. The indirect effect of this variable through risk orientation (X_3) was 0.3220, which itself exceeded the direct effect. The indirect effects of this variable were mainly routed through risk orientation (X_3), annual income (X_7) and educational status (X_1).

X_9 Indebtedness

The direct effect of indebtedness on the extent of adoption of improved agricultural practices was found to be substantial and negative (-0.2060). But the total indirect effect was positive and substantial (0.2702). The indirect effects were channelled mainly through annual income (X_7), economic motivation (X_4) and risk orientation (X_3).

X_7 Annual income

The direct and the total indirect effect of this variable were 0.1961 and 0.1396 respectively. The indirect effects were routed mostly through economic motivation (X_4) and risk orientation (X_3).

X_1 Educational Status

The direct and total indirect effects of this variable were 0.0934 and 0.4428 respectively. The high indirect effects of this variable were routed mainly through risk orientation (X_3), economic motivation (X_4) and annual income (X_7). The indirect effects of this variable routed through risk orientation (0.2385) and economic motivation (0.1732) themselves exceeded the direct effect.

VII. Constraints in Adoption of Improved Agricultural Practices by the Tribal Farmers

The tribal 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. The information was computed separately and presented in Table 18.

It could be observed that non-availability of inputs was reported as the most important problem by majority of the tribal farmers (79.09 per cent). This was followed by inadequate financial assistance (73.63 per cent). The other problems in the descending order of importance were damage to crops from wild pigs and elephants, lack of sufficient knowledge about the particular practice, exploitation by the middlemen, absence of legal right on the land, inadequate transport facilities, small size of the holding and lack of irrigation facilities.

Table 18. Constraints in adoption of improved agricultural practices by the tribal farmers

Sl. No.	Constraints	Frequency	Percentage	Rank
1	Lack of sufficient knowledge about the particular practices	63	57.27	IV
2	Inadequate financial assistance	81	73.63	II
3	Non-availability of inputs like planting material, fertilizers, farm implements etc.	87	79.09	I
4	Damage to crops from wild pigs and elephants	79	71.82	III
5	Exploitation by the middlemen	56	50.91	V
6	Small size of the holding	33	30.00	VIII
7	Absence of legal right on the land	49	44.54	VI
8	Lack of irrigation facilities	21	19.09	IX
9	Inadequate transport facilities	37	33.63	VII

VIII. Cultural- Anthropological characteristics of the selected tribe with special reference to folklores on agriculture

An overview of the cultural-anthropological characteristics of the Kanikkars is presented below.

Of the 35 scheduled tribes of Kerala, the largest group in Southern Kerala is the Kanikkars. They are popularly known as the 'Kanis'. The Kanikkar has receding forehead, flaring nostrils, prognathous jaw and brachycephalic head. Their colour varies from light to dark brown (Luiz, 1972). Their costume varies from semi nakedness to modern clothes. They speak Malayalam with a Tamil accent.

Kanikkars live mainly in the forests of Nedumanged and Neyyattinkara taluks. They believe themselves as descendants of emigrants from the neighbouring districts of Madurai and Thirunelveli (Gazetteer of India 1961). A legend connected with their origin states that they are the descendants of two tribal kings, Veerappan and Sithangan, who came from Pandi and settled on the Western slopes of the Western Ghats. The Attingal Raja conferred on Veerappan Arayan the title of "Veera Marthandan", and gave him certain rights. Veerappan decided to celebrate his status as chief of the Kanikkars and invited Adipandi, Nadu pandi, and Thalapandi chiefs to grace the occasion. Adipandi demanded the gift of Veerappan's sister

as a reward for gracing the occasion with his presence. Annoyed by this demand, Veerappan Arayan is believed to have diverted the water of the rivers flowing into the Pandian territory by constructing dams. Consequently the Pandian chiefs waged war against the Kanikkars who were ultimately defeated. A section of the defeated Kanis took refuge in the fertile mountains of Travancore (Dilip, 1983).

Kanikkars have the institution of headman who is popularly called "Muttukani". The Muttukani is an important and influential person whose office is hereditary and devolves on the newphew. His status has disappeared today and now he is more or less neglected. The Kanikkars also have the plathi (medicine man) who practices both medicine and black magic.

Kanikkars have the most elaborate division of exogamous clans. The Kanikkars of Kallar, Vithura and Aryanad recognise two main clans: Muttillom and Menillom. The Muttillom includes Mannati illom, Vellayillom, Thumbara illom, Thalayat illom, Kottapara illom, Mulekonath and Kurimilloms. The Menilloom includes Meenangal illom Pathotillom, Patikaillom, Paramala illom, Erumbiyat illom and Kythode illom. Regarding the origin of these clans, it was said that a wild elephant lay dead in the jungle, and the different parts of the carcase were appropriated by different men. The men, who could only get the earth where the carcase lay, belonged to Mannati illom. He who

carried the heart belonged to Vellayillom. One who carried away the genital organ became Thumbara illom. He who removed the head became Thalayat illom. He who found a kotta (basket) on a rock became Kottappara illom. He who removed the haunches became Mulalkonath illom. He who took a small share became Kurunillom. He who obtained the greatest share became Meenangal illom. He who got only the ants that swarmed there became Erumbiyat illom. The Pothode, Patika, Paramala and Kythode illoms are named after places Pothode, Patika, Parambala and the Kythode. Thus a few of the clans are named after the places.

The law of exogamy governs all marriages. It is said that the clan classifications were principally made to give a better system of life and to prevent endogamous marriages (Luis, 1972). Kanikkar is a matri lineal tribe. All members of the clan are of same blood (consanguineous) and so marriages within the clan are prohibited. Children belonged to the mother clan. The rules of inheritance are rather peculiar. But in recent times, among many sections of the patrilineal rule is coming to practice.

The Kanikkars have a glorious collection of superstitions and legends and a young Kani is verbally taught quite a lot of the history of the tribe. For this, they make use of the 'Patta pura' (Bachelors' dormitory). This institution is also undergoing decay.

Social equality exists among the sexes. However, women deny themselves the pleasure of sitting and eating with their husbands when visitors are present. A woman does not utter the name of her husband for it is regarded as sacred.

The Kanikkars' villages were not found near any of the high ways, as the Kanikkars preferred isolation from contact with the people of the plains. The villages were formed where there is a convenient water supply. Access to each village was always by a tortuous and often difficult route. The huts were built either in a row close to one another or wide apart. Bamboo formed the chief building material for the huts. The roofs were thatched with leaves of reeds which were also used for walling. The huts were generally rectangular in shape and insanitary. Being one roomed, the huts had no separate accommodation for sleeping. In the front of each hut, a broad verandah was provided. Mats formed the only furniture. The huts were dark as there were no openings other than the door in front and behind.

Of late, the situation is changing. Some of the Kanikkars are in possession of houses built by the ITDP, Punalur.

Inside the reserve forest, theyware nomadic agriculturalists as remarked by Thurston (1909);"the jungle Kanikkars have no permanent abode but shift about from one part of the forest to another". Shifting cultivation known as "Punam"

was practised by most of the tribal communities in the State in the past. They have now almost given up this practice mainly due to the rigorous rules introduced by the forest department, prohibiting their freedom to move from one place to another within the forest area (Tribal sub-plan of Kerala, 1979). Shifting cultivation, as it undoubtedly damages the forest to some extent, has always been a headache to the Forest Department. According to the Commissioner for Scheduled Caste and Scheduled Tribe (1964) " the shifting cultivation is still practised by tribals in some States. They should be settled on Government land or acquired land, if available which may be reclaimed and developed by employing these tribals on wages". The Kanikkars are now found to practice shifting cultivation within their holdings only.

As against the earlier fear that the shifting cultivation is ruinous and wasteful, another view has been evolved because shifting cultivation "involves clearing relatively small patches of forests at any one time, it creates less disruption of the forest ecology than would massive plough-agriculture" (Beals et al. 1977)

The policy was to transfer batches of population living on shifting cultivation. Now the approach to the problem seems to be "What ever be the merits of the policy to shift people as a long term remedy, the transfer of population from the

shifting cultivation areas to the lower regions down below does not appear to us to be a practical proposition that would yield results in the immediate future. Whatever be the method of approach, it should be practical and gradual without resort to compulsion from outside". (Report of the Commission for Scheduled areas and Scheduled Tribes, 1960-61). Besides cultivation, the Kanikkars are engaged in collection of minor forest produces. They collect tubers and roots-locally called Kavala (Dioscorea oppositifolia), Neduvan, Neendi etc. andother minor forest produces like honey, nellikka (Gooseberry), wild cardamom, Kuva leaves etc. from the forest.

Communal Agricultural Ceremonies

The primary needs of primitive humanity were the increase and multiplication of the resources of food, animal and vegetable. It has been said that the more varied the course of nature throughout the year, the more persistant probably will be man's efforts to regulate it for his benefit. In other words, the more marked the change of seasons, the greater will tend to be the volume of magic and the belief in its efficacy among the tribes.

The Kanikkars were nomadic agriculturalists in the past. Since their supply of food was not so assured, but subject to the uncertainities of weather, they made offerings to

their deities at every stage. Their primitive magico-religious ceremonies consisted of two orders of procedure, the one intended to please, attract and conciliate, and the other to cancel the harm which the Gods have the power to inflict. The relevent ancestral ceremonies and beliefs of Kanikkars as reported by Iyer (1937) are cited below:

Public ceremonies included the jungle clearing, breaking of the soil, and the harvesting. When they start jungle clearing about the end of Vrichchikom (November-December) on Friday at Sun rise, Kuva leaves (Curcuma anguistifolia) are laid for the sun, 'Thirumuthupara Sastha' 'Aranat Sastha', 'Ellakkal Sastha' and 'Kalakal Sastha'. Then four other leaves are laid lower down for 'Ponmudi devar', 'Kottakkal devar', 'Maruthumala devar' and 'Perunavari devar'. Still lower down, two leaves are laid for 'Odalamma Kali' and 'Ayyankali devi' and 52 leaves for ancestor spirits. In all these, the medicine-man places a handful of paddy. Further down are placed bill-hooks and a measure of paddy on leaves by the Headman. Women do not take part in the ceremony. The following prayer is chanted.

"Oh Muthi, Kodalikavu Mutha, may there be no disease among us. May you shield us from any cut or wound".

The audience stand in attention. The Headman takes a handful of paddy and distributes a few grains among the audience, who throw them on the leaves. Each man then takes his bill-hook. The Headman clears a part of the jungle first. He is then followed by the rest. He Headman cuts seven reeds and if no water or dirt is found inside the reeds, it is believed to be an auspicous sign for cultivation area. If there happens to be any dirt or water, they select another locality. When they return after clearing the forest, prayer is offered to the 52 devatas to the effect they cleared the jungle and that they desire to get enough food for the subsistence. One of them becomes inspired and says that they shall suffer no damage, if they work. When he comes to himself, the men eat heartily the food they have brought with them and go home. They do no more work for the day.

During 'Meenom' (March-April) the ceremony of throwing rice for Muthi starts. Four stakes are driven into the ground and two 'thattis' of reed are put up one above the other. On the thatti at the top are placed raw rice, coconut and a ball of rice powder. Frankincense is burnt and the following prayer is offered:-

"Oh Muthiyamma, Udayamutha, Kodatikavu Muthas of the hamlet, may we be enabled to live on paddy, the produce of our labour. May no wild elephant, wild boar, and other animals

cause any damage to our crops, and may you guard us from these animals!

Then they sow the paddy by broadcast. Women not in their menses and girls can attend the function. They believe that great harm will be done, if an unclean woman attends the function.

When the time approaches for harvest, another offering is given to 'Muthi' and 'Udayamuthan'. The prayer is to the effect that they may get all the paddy through the good grace of the Gods. Sheaves of corn are carried in headloads by the Headman and others and a 'Putharikoduthi' (Offerings of first fruits) is given. Paddy sheaves are threshed and the paddy is fried and made into beaten rice. All assemble early next morning and pray.

"Oh God, may you give us abundance of corn and riches".

At the time of harvest, if there is any death pollution, the harvest is delayed till the pollution ceases in the belief that wild animals would attack them or destroy their crops.

Harvesting is done by women and is completed by the end of Chingom (August-September) and the paddy is kept inside the hut. The Headman intimates that corn should be threshed and offered to God. Each man makes his contribution and paddy is hulled and offerings are made to the Sun, Sastha,

52 devatas, Muthi, Muthan, and Kodalichavu. Prayers are then offered to the following effect:

"We are going to thresh corn. Show us enough paddy. Pray do not harm us". Each man then dries his paddy and bundles it up in kuva leaves. He then suspends it to the rafters of the hut.

After the tenth of Kanni (September-October) comes the grand offering called 'Puppada Koduthi'. At the instance of the Headman, all the villagers bring bunches of plantain to him. They are left for three days, when a pit of 10 feet square and 3 feet deep is dug. Billets of fuel are then burnt in the pit, and when they are burnt out, maruthi leaves are placed over the embers. The plantains are then placed over the leaves and again covered with maruthi leaves and earth. They are smoked for three days through a hole. On the fourth day, the Headman calls the people to make the offering. There is feasting that evening, followed by singing. The five paras of paddy collected for the purpose are distributed as follows:-

For Muthi Amma - three measures; for the 52 devatas two paras of paddy are hulled, the rice powdered and made into a paste; seven measures of paddy are hulled, and the rice cooked and put into sieves. All these are placed on the sacred spots where the villagers have gathered. The ripe

plantains are removed from the pit. Five measures of rice are spread out for the Sun, Sastha, and other divinities in parallel rows, one below the other. Over this is placed rice paste on kuva leaves. This is covered by leaves and plantains are placed over them. Seven handfuls of rice are placed for 'Alithampuran' and 'Kalathu Thampuran'. Maruthi leaves are then spread lower down to a length of fifty feet and to a width of one foot. Three goats are bathed, decorated with flower tied round their necks, and sacrificed. The following prayer is then offered -

> "We have little to offer. Pray accept our small offerings as a large one, and protect our children".

Furits are then distributed and the goats'flesh is divided equally between all. They then return home.

The final Koduthi(offering) comes on the fifth of Virchikam (about 20th November). Each man contributes one measure of paddy. The paddy thus collected is hulled and the rice is converted into a paste. At sun rise, they go to the sacred spot and set fire to all the dry leaves that are lying about. The following prayer is then chanted.

> "Oh God, we make this offering after removing the sweepings of flowers. Pray accept it without demur and be well disposed to us".

The paste is then fried and distributed to all. This completes the ceremonies relating to agriculture.

The ceremonies are still practiced in a more or less simple way. Shifting cultivation has gradually diminished in nature. Songs related to agriculture have been vanished from the memories of the tribal farmers. At present, the tribal children are more interested to hear film songs from radio, rather than singing their ancestral songs.

Since many of the tribal people in the area are now after government jobs and employments outside their farms, their interest in folklores on agriculture has been almost lost. The researcher could observe a radical change in the cultural characteristics of the Kanikkars of Nedumangad from those reported by Iyer (1937) and Thurston (1909).

DISCUSSION

CHAPTER V

DISCUSSION

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

I Extent of knowledge about the improved agricultural practices by the tribal farmers.

II Attitude of tribal farmers towards farming

III Extent of adoption of improved agricultural practices by the tribal farmers.

IV Correlation analysis between the independent variables and the dependent variables.

V Relative importance of the selected socio-psychological and socio-economic characteristics and their contribution in explaining the dependent variables.

VI Direct and indirect effects of the independent variables on the dependent variables.

VII Suggestions to enhance the rate of adoption by tribal farmers.

I. Extent of knowledge about improved agricultural practices by the Tribal farmers.

The results given in Table 6 revealed that majority of the tribal farmers in the study area had medium level of knowledge about improved agricultural practices.

This medium level of knowledge might be due to the relatively more educational facilities the Kanikkars enjoy than the rest of the tribal population in Kerala. This is

evident from the literacy rate of the tribal population of Nedumangad taluk as compared to the tribal population of other taluks. Another reason for their medium level of knowledge might be due to their frequent contacts with the non-tribal population of the surrounding areas. Many of the Kanikkars have now turned to be agricultural labourers working in the farms of the encroachers. The developmental activities of the Block - Extension personnel and the voluntary organisation 'Mitraniketan' operating in some of the tribal settlements might also have contributed to their knowledge about the improved agricultural practices.

II. Attitude of tribal farmers towards farming

The results presented in Table 7 revealed that majority of the Kanikkars had a medium level of attitude towards farming.

This might be partly due to the restrictions imposed on them by the Forest officials. Earlier, these tribal people were practicing shifting cultivation known as 'Punam'.

According to Thurston (1909) as quoted by Iyer (1937), "the jungle Kanikkars have no permanent abode, but shift about from one part of the forest to another". But now they have given up this practice mainly due to the rigorous rules introduced by the Forest Department, prohibiting their freedom to move from one place to another within the

forest area. Hence their income from agriculture was drastically reduced. To add to this, exploitation by the middlemen, perhaps also has made the Kanikkars develop a less favourable attitude towards farming.

But when compared to many other tribal communities of the State which exhibit an unfavourable attitude towards farming as revealed by Prakash (1980), the position of the Kanikkar is satisfactory. This might be due to the influence of practising non-tribal farmers of the area with whom they interact as labourers. Again, the medium level of attitude of the Kanikkars towards farming could also be due to the loan facilities rendered to them, by the different Girijan Service Co-operative Societies operating in the area for agricultural purpose.

III. Extent of Adoption of Improved Agricultural Practices by the Tribal farmers

A perusal of the Table 8.1 indicated that majority of the tribal farmers of the study area had only low level of adoption of improved agricultural practices.

Though the Kanikkars had medium level of knowledge about the improved agricultural practices and medium level of attitude towards farming, their level of adoption of improved agricultural practices was found to be low. This

might be due to the reasons mentioned below:

Any innovation which is to be adopted by the tribals, has to be necessarily the one which fits in with their habits, their convenience and the economic conditions. A habit and way of life which has been built up through the generations can only be changed over a particular period. Further, as most of the agricultural practices being followed by them have been adopted after years of trial and error, it would be difficult to expect them to discard the existing techniques altogether and to accept new methods overnight. If at all it is possible, it could be the result of effective extension work only. Hence the inadequacy of extension work in the tribal pockets could be the reason for the low level of adoption. Another reason might be the lack of implements to adopt improved agricultural practices. Many of the simple farm implements commonly used by non-tribals are even now out of reach of the tribal farmers.

Lack of confidence, perhaps might be another reason for the low adoption of improved agricultural practices. The tribals have been greatly exploited from the very beginning by non-tribals in different ways and as such they might have lost confidence in development activities of Government or other social organisations.

Though the Kanikkars had medium level of knowledge about the improved practices and more or less a favourable attitude towards farming, they believe in immediate consumption and therefore they care for daily needs only and do not plan even for tomorrow. This might be another reason for the low level of adoption of improved practices which mostly necessitate additional expenditure and planning.

Lack of supply of adequate quantity of inputs and lack of approach road and transport facilities might also have contributed to their low level of adoption of improved agricultural practices. Regarding the adoption of individual practices in tapioca cultivation, the results presented in Table 8.2 revealed that a majority of the tribal farmers adopted weeding. This might be due to the fact that weeding does not incur any additional expenditure and also because of the availability of sufficient family labour. But at the same time, only a few were found to practice earthing up. This might probably be due to lack of sufficient knowledge about the particular practice and its significance. Only a minority has been found using chemical fertilizers. This could be due to the inadequate knowledge about the fertilizers, methods of their application and their non-availability in the area. Majority of the tribal farmers were found adopting incorrect spacing while planting setts. This

might also be due to the ignorance about the recommended spacing, and the importance of proper spacing. The non-adoption of many of these practices was found to be either due to inadequate knowledge about the practice or due to inadequate supply of the inputs in the tribal areas.

IV. Correlation between the Independent variables and the Dependent variables

A. Correlation between the selected independent variables and extent of knowledge about improved agricultural practices

The results presented in Table 9 indicated that educational status was found to have significant and positive relationship with extent of knowledge about improved agricultural practices. This was in conformity with the research findings of Supe and Salode (1975), Somasundaram (1976), Janakiramaju (1978), Kaleel (1978) and Balachandran (1983). The significant relationship of the variable with the extent of knowledge indicated that education has helped to obtain knowledge about new agricultural technology and comprehend new ideas faster and better. Moreover, education might have enabled them to interact with various organisations and agencies and acquire more information regarding modern agricultural practices.

Social participation was found to have significant and positive relationship with the extent of knowledge about improved agricultural practices. It could be inferred that as a result of social participation, the tribal farmers established more contacts with other people, which might have resulted in improving their knowledge level.

Risk orientation was found to have significant and positive relationship with the extent of knowledge about improved agricultural practices. A farmer who is willing to take risk, is sure to enter into new experience in his farming life. This experience might result in increasing his knowledge about that particular practice. This result was in conformity with the findings of Kamarudeen (1981).

Fatalism was found to have significant and negative relationship with extent of knowledge about improved agricultural practices. The belief that human situations are pre-determined makes the tribal farmers more conservative as a result of which they tend to be more tightly bound by traditional thoughts and behaviour. Hence they may not be keen in acquiring more knowledge about the improved agricu tural technology and become stereotypes. This might be the reason for the significant and negative relationship between the two.

Cosmopoliteness was found to have significant and positive relationship with the extent of knowledge about improved agricultural practices. This was in conformity with the findings of Knight and Singh (1975), Somasundaram (1976), Kamarudeen (1981) and Balachandran (1983). Siddaramaiah and Rajanna (1984) also found that the farmers with high cosmopoliteness had significantly higher gain in knowledge about improved agricultural aspects.

The significant and positive association between cosmopoliteness and extent of knowledge might be due to the fact that the tribal people who interact with other people during their visits to nearest town/ city, receive more cues from them, that add to their existing knowledge and as a result, their knowledge level increases.

Annual income was found to have significant and positive association with that of knowledge about improved agricultural practices. This might be attributed to the fact that higher level of income that could be obtained from the particular improved cultivation practices encourages the tribal farmer to contact people for obtaining more information on such new practices.

From the above discussion, the hypotheses put forth in the case of educational status, social participation, risk orientation, economic motivation, fatalism, cosmopolite-

ness and annual income with the extent of knowledge about improved agricultural practices, were accepted. But the hypotheses put forth in the case of Status of land tenancy and indebtedness were rejected, since no significant association could be noticed from the results given in Table 9.

B. Correlation between the selected independent variables and attitude of tribal farmers towards farming.

The results indicated that educational status was found to have significant and positive relationship with attitude of tribals towards farming. Similar results were reported by Kamarudeen (1981) in the case of attitude of farmers towards demonstration plots. Vijayakumar (1982) found that education of small farmers had significant relationship with their attitude towards improved coconut cultivation practices.

It could be inferred that the significant and positive relation between educational status and attitude of tribal farmers towards farming is due to the result of acquiring more knowledge through education, which influenced the favourable attitude towards farming.

Social participation was found to have significant positive relationship with attitude of tribal farmers towards farming. This might be due to the fact that as

social participation increases, the tribal farmers establish more contact with other people, which might have resulted in improving their awareness about the modern farming technology and its merits, thereby creating a favourable change of attitude. This result is in conformity with the findings of Das and Sankar (1973), who reported significant association between attitude of farmers towards improved agricultural practices and social participation.

Risk orientation was found to have significant and positive relationship with attitude of tribal farmers towards farming. In adopting new technology, certain amount of risk is involved, especially by the tribal farmers. When he takes up such risks and experiments new ideas or practices, he develops a favourable attitude towards farming as a result of his better chances of success in farming. This orientation might be the reason for the significant and positive relation between the two.

Similar result was obtained by Kamarudeen (1981) who reported significant relationship between risk preference and attitude of farmers towards demonstrated cultivation practices.

Economic motivation was found to have significant and positive relationship with attitude of tribal farmers towards farming. This was in conformity with the findings

of Somasundaram (1976) and Janakiramaju (1978). A farmer seeking more monetary gains is likely to invest more money on production inputs. Once more money is invested wisely and high yields are obtained, the farmer is likely to develop a positive attitude towards farming. This might be the reason for the positive and significant association between economic motivation and the attitude of tribal farmers towards farming.

Annual income was found to be significantly and positively correlated with attitude of tribal farmers towards farming. This might be due to the fact that the purchasing power of the tribal farmers to acquire the inputs necessary to practice new agricultural technology increases with increase in annual income. This in turn might have created a favourable attitude among them towards farming.

Status of land tenancy was found to have significant and negative correlation with attitude of tribal farmers towards farming. Exploitation of tribal people and alienation of land in the tribal areas are very common in the State. But the intensity of land alienation is not so serious in the tribal areas of Nedumangad taluk due to the reason that the tribal people have no 'Patta' (ownership documents). Irrespective of the fact that some of the land

is leased out, the farmers may adopt the improved agricultural practices in the land actually owned by them. But their attitude towards farming has been influenced due to the awareness that they now possess only a fraction of the land previously owned by them. Alienation of some land and consequent frustration might have created a negative attitude among these tribal farmers towards farming.

From the above discussions, the hypotheses put forth in the case of educational status, social participation, risk orientation, economic motivation, annual income and status of land tenancy with the dependent variable attitude of tribal farmers towards farming were accepted. But the hypotheses set forth in the case of fatalism, cosmopoliteness and indebtedness were rejected, since no significant association could be noticed from the results given in Table 10.

C. Correlation between the selected independent variables and extent of adoption of improved agricultural practices by the tribal farmers

From the results given in Table 11, it was found that educational status had significant and positive relationship with extent of adoption of improved agricultural practices by the tribal farmers. This might be due to the fact that education might have helped them to acquire knowledge about

the new practices and comprehend new ideas faster and better, which could have helped in taking positive decisions in adoption of improved practices. As a result of acquiring more knowledge, their attitude also might have changed, leading to increased rate of adoption of improved agricultural practices.

This result was in conformity with the findings of many researchers (Perumal, (1970); Viswanathan, (1972); Chandrakandan, (1973); Kamble, (1973); Ramamoorthy, (1973); Vellapandian, (1974); Prakash, (1980).

Social participation was also found to have significant and positive relationship with the extent of adoption of the tribal farmers. This significant and positive association of social participation with extent of adoption was reported by many researchers also (Anbalagan, (1974); Bhilegaonkar, (1976); Somasundaram, (1976); Sadamate, (1978); Singh, (1979); Ravichandran, (1980).

Social participation encourages tribal farmer to establish contact with various institutions which play an important role in re-orienting their cognitive and affective domain, which in turn influences the adoption behaviour. The results of the study fully supports this reasoning.

Risk orientation was found to have significant and positive association with extent of adoption of improved agricultural practices by the tribal farmers. The proposition that there is relationship between risk orientation of tribal farmers and the extent of adoption of improved agricultural practices was supported by the results of this study and is in conformity with the findings of Jaiswal (1965), Nair (1969), Ernest (1973), Ramachandran (1974), Singh (1975), Bhilegaonkar (1976), Tripathy (1977), Balasubramonian (1977) and Rajendran (1978).

It is quite logical to assume that with more risk orientation, a farmer is more likely to invest money on scientific agricultural practices. This results in a change of attitude and extent of knowledge in the improved agricultural practices as a result of which the farmer is more likely to understand the techniques of improved agricultural practices and consequently he is prepared to try the practices. Success of the trials motivates him to make continued use of the improved agricultural practices. This leads to an increased extent of adoption.

Economic motivation was found to have significant and positive relationship with extent of adoption of improved agricultural practices. The significant relationship might be due to the fact that a farmer who invests more

money on 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 was in conformity with findings of Hobbs (1964), Seal and Sibley (1967), Singh (1968), Nair (1969), Singh and Singh (1970), and Mazumdar (1976), who had reported that economic motivation was significantly correlated with adoption.

Annual income was also found to be significantly and positively associated with extent of adoption of improved agricultural practices. One of the reasons for the significant relationship between income and adoption might be that increased income enhances risk bearing capacity of the tribal farmers. That means the high income group of tribal farmers may try new practices even if they involved the element of risk. Another reason is that the purchasing power of the tribal farmers to acquire the inputs necessary to adopt new technology considerably increases with increase in income. These might have contributed for the significant association between annual income and extent of adoption.

The result is in conformity with the findings of Sadamate (1978) and Sushama (1979) among the tribal farmers. Many other researchers also had obtained similar results (Lionberger, (1960); Jaiswal and Singh, (1968); Hussian, (1971); Perumal and Duraiswamy, (1972); Chandrakandan, (1973); Kaleel, (1978); Pillai, (1978).

From the above discussions, the hypotheses formulated in the case of educational status, social participation, risk orientation, economic motivation and annual income with the extent of adoption of improved agricultural practices by tribal farmers were accepted. But the hypotheses formulated in the case of fatalism, cosmopoliteness, status of land tenancy and indebtedness were rejected as no significant association could be noticed from the results given in Table 11.

V. Relative importance of selected socio-psychological and socio-economic characteristics and their contribution in explaining the dependent variables.

A. Relative importance of the selected independent variables and their contribution in explaining the extent of knowledge about improved agricultural practices.

The nine variables, viz. educational status, social participation, risk orientation, economic motivation, fatalism, cosmopoliteness, annual income, status of land

tenancy and indebteness taken for the study had jointly explained about 74 per cent of the variation in extent of knowledge about improved agricultural practices. Out of these nine variables, 5 variables namely risk orientation, educational status, indebtedness, social participation and economic motivation, alone contributed to 73 per cent of the variation. In other words, the contribution of variables other than these 5 variables was not significant in predicting the extent of knowledge about improved agricultural practices.

An over view of Table 12.2 revealed that though the 5 variables were collectively significant in prediction as indicated by the F-value, only coefficients of the variables risk orientation, educational status and indebtedness were individually significant in prediction by the 't' values.

Risk orientation and higher educational status are symbols of progressiveness. Collectively, these two attributes make the tribal farmers exposed to outside people and new technology which in turn provide them more knowledge abut improved agricultural practices. So it is quite logical to assume that farmers with more risk orientation and educational status have more knowledge about improved agricultural practices.

The partial regression coefficient indicated that an unit increase in indebtedness would bring a decrease of 3.4492 units in the extent of knowledge, cetaris paribus. It is presumed that as income of an individual increases, facilities, both physical and financial to obtain formal education increases, which in turn will increase knowledge. Hence it is quite logical to think that as indebtedness increases, the facilities for formal education decreases, which in turn will influence adversely their knowledge. This fact has been established by the socio-economic survey of tribals in Kerala conducted by Bureau of Economics and Statistics (1976-78). The report published by them brought to light that the main reason for the school drop outs in tribals areas was indebtedness.

In the light of the above discussions it could be noted that risk orientation, educational status, indebtedness, social participation and economic motivation were mainly responsible for contribution towards knowledge in improved agricultural practices.

Risk orientation alone contributed to 55 per cent increase in the extent of knowledge about the improved agricultural practices and hence this variable emerged as the most important in prediction.

B. Relative importance of the selected independent variables and their contribution in explaining attitude of tribal farmers towards farming.

The nine variables viz. educational status, social participation, risk orientation, economic motivation, fatalism, cosmopoliteness, annual income, status of land tenancy and indebtedness taken for the stepwise regression analysis jointly explained 69.6 per cent of the variation in attitude of the tribal farmers towards farming. Of these nine variables, 7 variables namely risk orientation (X_3) education (X_1), indebtedness (X_9), Annual income (X_7), social participation (X_2), economic motivation (X_4) and status of land tenancy (X_8) jointly contributed to 69.5 per cent of the variation. In other words, the contribution of the other two variables was not significant in predicting the dependent variable.

Though these seven variables collectively were significant in explaining the attitude of tribal farmers towards farming, only the coefficients of three variables namely risk orientation, educational status and indebtedness were individually significant in the prediction.

It is quite logical to assume that with more of risk-orientation and educational status, a farmer is more likely to invest money on scientific agricultural practices such as improved or good quality planting material, application of fertilizers, and use of plant protection methods. As and

when he invests money and adopts improved farm technology, he gets more profit from farming enterprise. Probably this appears to influence their attitude towards farming, where in they develop a positive outlook towards scientific agriculture as such.

The indebtedness of the tribal farmers and consequent exploitation by the non-tribal population of the surroundings might have led to their less favourable attitude towards farming. Exploitation of the tribal farmers of Kerala by the non-tribal population in different ways have been amply explained by Mathur (1977) and Menon (1979).

It was seen from the results that Risk orientation alone contributed to 61 per cent of the attitude of tribal farmers towards farming and hence this variable emerged as the most important in prediction.

C. Relative importance of the selected independent variables and their contribution in explaining extent of adoption of improved agricultural practices by the tribal farmers.

The nine variables taken for the stepwise regression analysis had jointly explained for 63 per cent of the variation in extent of adoption of the improved agricultural practices. Of these nine variables, five variables viz. risk orientation (X_3), economic motivation (X_4) indebtedness (X_9), annual income (X_7) and educational status (X_1) collectively contributed to 62.8 per cent of the variation.

In other words, the contribution of the other variables were not significant in predicting the extent of adoption of improved agricultural practices. Though these five variables collectively were significant in explaining extent of adoption, only the variables, risk orientation, economic motivation, indebtedness and annual income were individually significant in predicting the behaviour of the dependent variable.

Economic motive strongly influences and moulds the behaviour of individuals. It is this motive that drives them to take risk so as to have the fruits of windfall profits in adoption of innovations. Hence it is logical to assume that farmers with more risk orientation and economic motivation have more adoption of improved agricultural practices.

Indebtedness was also found significant in predicting the adoption behaviour of tribal farmers. With increasing indebtedness, the tribal farmer may not be able to invest more money on production inputs required for scientific agriculture. Another reason could be that indebtedness might have acted as an inhibitory mechanism, directing the farmer to behave in accordance with past experience, thereby devoiding himself of opportunities to try new practices. Hence it is quite logical to assume that tribal farmers with more indebtedness are low in adopting the improved agricul-

tural practices.

The results revealed that risk orientation alone contributed to 51 per cent of the variation in extent of knowledge about improved agricultural practices by the tribal farmers and hence this variable emerged as the most important in prediction.

The studies bring to light the need of enhancing the risk bearing capacity of the tribal farmers by motivating them to invest more money on scientific agricultural practices such as quality planting materials and fertilizers. Educating the farmers in the modern agricultural technology will be useful. The Co-operatives can do help by providing loans for scientific agriculture. Intrinsic motivation of the tribal farmers is to be developed by proper guidance.

IV. Direct and indirect effects of the selected Independent variables on the Dependent variables.

A. Direct and indirect effects of the selected independent variables on extent of knowledge about improved agricultural practices by the tribal farmers.

The results presented in Table 15.3 indicated that the variable risk orientation (X_3) had maximum direct effect on the dependent variable followed by educational Status (X_1).

As risk orientation exhibited the maximum positive direct effect and also the highest positive correlation value with attitude towards farming, this variable should be taken as a criterion in understanding the extent of knowledge about improved agricultural practices by the tribal farmers.

It has already been pointed out in the earlier part of the discussion that risk orientation and educational status were considered as indicators of the progressiveness of farmers and hence they had the maximum direct effect on extent of knowledge about improved agricultural practices of the tribal farmers. The substantial indirect effects of risk orientation were mainly routed through educational status and economic motivation. It is quite natural that only those individuals who have sufficient education to understand and comprehend the merits of improved farming and those with the motive to rise in life would be willing to take risks.

B. Direct and indirect effects of the selected independent variables on attitude of tribal farmers towards farming.

Regarding the attitude of tribal farmers towards farming, the results of path analysis given in Table 16.3 showed that risk orientation had maximum direct effect followed by educational status. As risk orientation exhibited the maximum positive direct effect and also the

highest positive correlation value with attitude, this variable should be regarded as a criterion in understanding the attitude of the tribal farmers towards farming.

C. Direct and indirect effects of the selected independent variables on extent of adoption of improved agricultural practices

The results of path analysis given in Table 17.3 indicated that risk orientation had the maximum direct effect on extent of adoption followed by economic motivation. As risk orientation exhibited the maximum positive direct effect and also the highest positive correlation value with extent of adoption, this variable should be considered as a cirterion in understanding the extent of adoption of improved agricultural practices by the tribal farmers. The reasons are too obvious and explicit to mention them here again.

VII. Suggestions to enhance the rate of adoption by tribal farmers.

Based on the participant observation, and experience during the course of data collection and discussions conducted with the officials working in the tribal areas, the following suggestions are put forth to solve the problems, enhance the rate of adoption and to improve the standard of living of the tribal farmers.

Agriculture

1. Encourage mixed cropping: Many of the tribal farmers are having small and marginal holdings. Their agriculture is predominantly domestic-oriented. In this context, mixed cropping seems to be more meaningful and its promotion is more appropriate.

2. Promote credit facilities: Though Kanikkars had medium level of knowledge and a medium attitude towards farming, their extent of adoption of improved practices had been in low level. This was mainly due to lack of credit facilities. They were subjected to exploitation by middle men who advanced small amounts to these poor people at crucial times and got the standing crop hypothecated to them. To avoid this type of exploitation, sufficient credit should be made available to them from the different banking institutions without over burdening formalities.

3. Providing marketing facilities: Most of the tribal farmers are not getting due value for the produce. They were exploited by the middle men. This naturally had reduced their interest in adoptionof the recommended practices. To avoid the exploitation by middlemen, a social marketing net work is to be established in these tribal areas. The Girijan Service Co-operative Society can take up this responsibility.

4. Implementation of Soil conservation practices: Because of the undulating topography, soil erosion had been a serious problem of the tribal areas. They were cultivating tapioca as the major crop. Tapioca is an erosion permitting crop which makes the erosion hazards worse. Hence introduction of soil conservation schemes with cent per cent subsidy that is available for tribal areas is a need of the time. The soil conservation unit of the Department of Agriculture can take up this work.

5. Implementation of crop improvement schemes: Cultivation of rubber and cashew on hill tops and slopes and arecanut in the valleys is to be encouraged. Cultivation of locally improved varieties of pepper, sweet potato, tapioca, vegetables and pulses should be given much emphasis.

6. Encouragement of afforestation programme by planting orchard plants: The forest lands where the tribals inhabit are ideal for fruit crops like mango, jack, guava, gooseberry etc. These crops can be cultivated without much management or tillage.

7. Providing agricultural loans on crop-hypothecation basis to these tribal farmers from commercial banking institutions or co-operative societies instead of equitable mortgage of land, as they have no ownership right on forest lands.

8. Cultivation of medicinal plants: Many of the medicinal plants were found in the local flora and the tribal farmers are aware of their utility. Hence, cultivation of medicinal plants can easily be encouraged among them.

9. A major constraint for adoption of improved practices, as pointed out by the tribal farmers was the damage to their crops caused by attack from wild pigs. Control of this by providing barbed wire fencing in vulnerable points of tho forest is suggested.

10. Adequate co-ordination between the various development agencies for the uplift of the tribals is necessary. It has been found that various agencies like Tribal Development Department, (NES) Block, Agriculture Department, Health Department and Voluntary organizations like Mitraniketan are operating in the tribal areas. But there is no proper co-ordination to streamline their efforts in desirable direction. So, sufficient emphasis should be given for the coordination between the different agencies operating in these areas.

11. Supply of inputs and monitoring: Though several inputs had been supplied through the different development agencies, it was found that most of them were not properly utilised, rather misutilized. Many of the implements

supplied to these tribal farmers have gone to the hands of the local non-tribal people. So, monitoring of such schemes and programmes implemented is to be undertaken to study their impact.

Training

12. Training of the tribal people: Provide short term vocational trainings in the tribal areas itself in the following aspects.

a. Scientific Bee-keeping
b. Lac-extraction
c. Cultivation and processing of medicinal plants
d. Rodent control
e. Improved agricultural practices in tapioca cultivation.
f. Soil conservation aspects such as contour bunding.
g. Vegetable cultivation
h. Homestead farming
i. Cultivation of minor tuber crops such as colocasia, yams and dioscorea.

Education

13 Strengthen functional literacy programmes in the area especially for educating the women who take key roles in decision making of the family. Though many of the tribal

areas have functional literacy programmes, their functioning has not been found satisfactory. Hence steps for efficient working of these are to be taken up.

14. Tribal residential schools: In the study area, there is only one tribal residential school (at Chettiyan-para). More tribal residential schools are to be started. Steps to avail the grants allotted for them in time are also to be taken.

15. Opening more balvadies in the tribal areas is another point to be considered.

General

16. Dedicated extension work by employing dedicated extension personnel: Lack of commitment from the part of the extension workers seems to be an important bottle neck in implementing developmental programmes successfully in the tribal areas. Hence those who have integrity and empathy for the tribal people are to be identified and entrusted with such programmes in these areas.

17. To improve the socio-economic status of the tribal farmers, it is necessary to check the indebtedness caused by the evils of drink. This has to be curtailed to the minimum by social education works.

18. Saving habits are to be encouraged among the tribals. The tribal people have no planning for their future. This condition should be changed by extension work and social education and they are to be motivated to make savings for a better tomorrow.

19. Improving the transport facilities- Lack of approach road and transport facilities make the developmental efforts difficult. Hence adequate steps are to be taken for improving the transport facilities to the tribal areas.

SUMMARY

CHAPTER VI

SUMMARY

Ever since our independence, a large number of developmental programmes have been launched in the tribal areas of the country. Still, tribal people form the decisively poorest section of our society. Modern technology has not been recognised by the tribal farmers as an essential element in improving their economic conditions and they mainly resort to the traditional subsistence farming.

The present study was an attempt to understand the adoption behaviour of tribal farmers towards improved agricultural practices and the constraints in adoption of these practices.

The specific objectives of the study were:

1. To study the extent of knowledge about improved agricultural practices by the tribal farmers.
2. To study the attitude of tribal farmers towards farming.
3. To study the extent of adoption of improved agricultural practices by the tribal farmers.
4. To study the relationship between the extent of knowledge, attitude, adoption and the socio-psychological and socio-economic characters.

5. To identify the constraints in adoption of improved agricultural practices by tribal farmers.
6. To suggest measures to enhance the rate of adoption.
7. To study the cultural-anthropological characteristics of the selected tribes with special reference to folklores an agriculture.

The investigation was carried out in the Nedumangad taluk of Trivandrum district which accounts for the maximum Kanikkar population of the State. From the 20 villages of the taluk, six villages having maximum tribal population were selected for the study. From these villages further selection of respondents was done by simple random sampling. One hundred and ten tribal farmers constituted the sample size for the study. Educational status, social participation, risk orientation, economic motivation, fatalism, cosmopoliteness, annual income, status of land tenancy and indebtedness were selected as independent variables based on review of literature and rating of judges. Extent of knowledge about improved agricultural practices, attitude towards farming and extent of adoption of improved agricultural practices were dependent variables. The problems perceived by the tribal farmers in adoption of improved agricultural practices were studied and an attempt was made to investigate their cultural-anthropological characteristics with special reference to folklores on 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. Social participation was measured by using the procedure developed by Lokhande (1974). Supe's (1969) risk preference scale was used to measure risk orientation. The scale developed by Moulik (1965) was made use of to measure economic motivation. Fatalism was measured by using the scale developed by Chattopadhyaya as used by Verma (1970). Cosmopoliteness was measured using the schedule developed by Desai (1981). Annual income and indebtedness were measured using the respective schedules developed for the purpose. Status of land tenancy was measured using the scoring procedure developed for the purpose.

The dependent variable extent of knowledge about improved agricultural practices was measured using a test developed for the purpose. Forty items were selected in the objective form and slightly modified on the basis of pretesting and administered to 30 respondents. The scores were arranged in the descending order of total scores and the respondents were divided into three equal groups. for item analysis, the middle group was eliminated. The data pertaining to the correct responses for all the

items in respect of the higher and lower groups were tabulated and the difficulty and discrimination indices were worked out. The difficulty and discrimination indices were the criteria for item selection for the final knowledge test. The selected 14 items formed the format for the knowledge test. Reliability and validity of the test were found out before including the test in the final interview schedule.

Attitude of tribal farmers towards farming was measured using the scale developed by Sadamate (1978) in a tribal study. Adoption was measured by using a scale developed for the purpose in which scores were assigned for each of the components of the improved agricultural practices.

An interview schedule finalised after pre-testing was used for data collection. The schedule was translated into Malayalam for use in the field. The data were collected by interviewing the respondents individually. Group discussions and participant observation were also used to elicit information. The data were subjected to correlation analysis, stepwise regression analysis and path analysis. Percentages were also used for making simple comparisons.

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

1. The study revealed that majority of the Kanikkars had a medium level of knowledge about improved agricultural practices and a medium level of attitude towards farming. Regarding the extent of adoption of improved agricultural practices, majority of the Kanikkars had only a low level of adoption.

2. Correlation studies revealed that educational status, social participation, risk orientation, economic motivation, cosmopoliteness and annual income had positive and significant relationship with the extent of knowledge about improved agricultural practices while fatalism had negative and significant correlation with the extent of knowledge. Status of land tenancy and indebtedness was found to have no correlation with the extent of knowledge.

3. In the case of attitude of tribal farmers towards farming, correlation studies revealed that educational status, social participation, risk orientation, economic motivation and annual income had positive and significant relationship. Status of land tenancy had negative and significant relationship with the attitude towards farming. Fatalism, Cosmopoliteness and indebtedness were not related with the attitude.

4. Results of the zero order correlation indicated that educational status, social participation, risk orientation, economic motivation and annual income had positive and significant relationship with extent of adoption of improved agricultural practices. Fatalism, Cosmopoliteness, status of land tenancy and indebtedness were found not related with the extent of adoption.

5. Step-wise regression analysis revealed that all the nine independent variables (educational status, social participation, risk orientation, economic motivation, fatalism, cosmopoliteness, annual income, status of land-tenancy and indebtedness) selected for the study jointly explained 74 per cent of the variation in the extent of knowledge about improved agricultural practices. The five variables namely risk orientation, educational status, indebtedness, social participation and economic motivation alone fitted in the regression equation contributed to 73 per cent of the variation. Risk orientation emerged as the most important variable in prediction of the extent of knowledge, as this alone contributed to 55 per cent of variation.

6. In the case of attitude towards farming, stepwise regression analysis revealed that all the nine variables jointly explained 69.6 per cent of the variation whereas the seven variables, except the variables fatalism and

cosmopoliteness, alone fitted in the regression equation contributed to 69.5 per cent of the variation. Risk orientation emerged as the most important variable in the prediction of the attitude towards farming as this alone contributed to 61 per cent of the variation.

7. Stepwise regression analysis further revealed that all the nine variables jointly explained 63 per cent of the variation in extent of adoption of improved agricultural practices. The five variables viz. risk orientation, economic motivation, indebtedness, annual income and educational status alone fitted in regression equation contributed to 62.8 per cent of the variation. Here also, risk orientation which contributed to 51 per cent in the prediction of extent of adoption emerged as the most important variable.

8. Results of path analysis indicated that risk orientation had maximum direct effect on the extent of knowledge. The indirect effects of this variables were mainly routed through educational status and economic motivation.

9 In the case of attitude towards farming, results of path analysis indicated that risk orientation had maximum direct effect. The indirect effects of this variable were mainly routed through educational status and economic motivation.

10. Results of path analysis in the case of extent of adoption of improved agricultural practices also indicated that risk orientation had the maximum direct effect. The indirect effect of this variable was mainly channelled through economic motivation.

11. The tribal farmers perceived the following as the major constraints in adoption of improved agricultural practices in the descending order of magnitude: Non-availability of inputs, inadequate financial assistance, damage to crops from wild pigs and elephants, lack of sufficient knowledge about the practice, exploitation by the middlemen, absence of legal right on the land, inadequate transport facilities, small size of the holding and lack of irrigation facilities.

12. Suggestions to enhance the rate of adoption and to improve the standard of living of the tribal farmers are the following:

* Encourage mixed cropping.
* Promote credit facilities from different banking institutions without over burdening formalities.
* Provide market facilities
* Implement soil conservation practices with the assistance of the Soil conservation unit of the Department of Agriculture.
* Encouragement of afforestation programme by planting orchard plants.

* providing loans on crop-hypothecation basis.
* Cultivation of medicinal plants
* Control attack from wild pigs.
* Provide adequate co-ordination between the various development agencies operating in the area.
* Supply of inputs and monitoring.
* Provide short term, vocational trainings in the tribal areas itself in scientific bee-keeping, lac-extraction, cultivation and processing of medicinal plants, rodent control, improved agricultural practices in tapioca cultivation, soil-conservation aspects such as contour bunding, and vegetable cultivation etc.
* Strengthen functional literacy programmes in the area for educating the tribal women.
* Start more tribal residential schools in the area.
* Open more balvadies in the tribal area.
* Entrust the extension work in tribal areas to dedicated extension workers.
* Control the evils of drink by social education works.
* Encourage saving habits among the tribals.
* Improve the transport facilities in the area.

13. Regarding their cultural-anthropological characteristics, the Kanikkars have receding forehead, flaring nostrils, progranathous jaw and brachycephalic head. Their costume varies from semi-nakedness to modern clothes. Though they practiced shifting cultivation in the forest in earlier days, now the practice has been restricted due to forest department regulations. But they are found to practise

shifting cultivation within the holdings. The Kanikkars had a glorious collection of supersition and legends. But now these have undergone decay. The communal agricultural ceremonies include different types of 'Koduthis' (offerings) like 'Puthian Koduthi'(offering of first fruits), 'Puppada Koduthi' etc. But the songs related to agriculture had been vanished from the memories of the tribal farmers. The researcher observed a radical change in the cultural characteristics of the Kanikkars of Nedumangad from those reported by early anthropologists.

In conclusion, it can be said that the Kanikkars of Nedumangad taluk are less progressive when compared to the non-tribals of the State. But they are more progressive as compared to the other tribal communities. It is possible to improve their farming and consequently their socio-economic conditions by systematic education and dedicated extension work.

Suggestions for future research

1. A comprehensive study in the tribal area on adoption of improved agricultural practices of other crops such as coconut and vegetables may be conducted.

2. A case study may be conducted on the development of Kanikkars of Amboori which has not been brought under the purview of this study.

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* Originals not seen.

APPENDICES

APPENDIX I

List of the Scheduled Tribes of Kerala

1. Adiyan
2. Aranadan
3. Eravallan
4. Hill Pulaya
5. Irular, Irulan
6. Kadar
7. Kammara
8. Kanikkaran, Kanikkar
9. Kattunaickan
10. Kochu velan
11. Konda kapus
12. Konda reddis
13. Koraga
14. Kota
15. Kudiya, Melakudi
16. Kurichian
17. Kurumans
18. Kurumbans
19. Malamalasar
20. Mala Arayan
21. Mala Pandaram
22. Mala Vedan
23. Malakuravan
24. Malasar
25. Malayan
26. Malayarayar
27. Mannan
28. Marati (in Hosdurg and Kasaragode taluks of Cannanore district)
29. Muthuvan, Mudugar, Muduvan
30. Palleyan
31. Palliyan
32. Peniyan
33. Pulayan
34. Ulladan (Hill dowellers)
35. Uraly

Source: Census of India, 1981, series- I Part II B(iii)

APPENDIX II A

List of items initially selected for the knowledge test

Sl. No.	Item	Response category
1	2	3
1.	Name a planting season for tapioca	Correct (1) / Incorrect (0)
2.	Water logged soils is the best suited for tapioca, than well drained soils.	Yes (0) / No (1)
3.	Tapioca is an erosion resistant crop	Yes (0) / No (1)
4.	Clayey soils are more suited for tapioca cultivation	Yes (0) / No (1)
5.	Planting tapioca on hills will prevent soil erosion	Yes (0) / No (1)
6.	Soils with rocky substrate are not suited for tapioca	Yes (1) / No (0)
7.	Moisture is required in the soil at the time of planting	Yes (1) / No (0)
8.	Tapioca cannot withstand cold climate	Yes (1) / No (0)
9.	Tapioca crops are affected by frost	Yes (1) / No (0)
10.	Sandy soils are best suited for tapioca cultivation	Yes (0) / No (1)
11.	Name a high yielding variety of tapioca	Correct (1) / Incorrect (0)
12.	Name a tapioca variety with good cooking quality	Correct (1) / Incorrect (0)
13.	Name a tapioca variety high starch content	Correct (1) / Incorrect (0)
14.	Name a branched type of tapioca variety	Correct (1) / Incorrect (0)
15.	Name the recommended variety of tapioca in your locality	Correct (1) / Incorrect (0)
16.	Planting setts in mounds gives better yield	Yes (1) / No (0)
17.	Vertical planting is preferable to horizondal planting	Yes (1) / No (0)

(contd..)

Appendix II A(contd.)

1	2	3		
18.	Digging of soil is required before planting tapioca	Yes (1)	/	No (0)
19.	Whether immature stems of tapioca can be used for taking setts for planting	Yes (0)	/	No (1)
20.	What should be the length of the setts for planting?	Correct (1)	/	Incorrect (0)
21.	What spacing is to be given for planting tapioca?	Correct (1)	/	Incorrect (0)
22.	Branched type of tapioca requires more spacing	Yes (1)	/	No (0)
23.	Intercropping is profitable in tapioca	Yes (1)	/	No (0)
24.	Name a crop suitable for inter-cropping in tapioca	Correct (1)	/	Incorrect (0)
25.	Fertilizers should be applied to increase the yield of tapioca	Yes (1)	/	No (0)
26.	Name a fertilizer which could be used for increase yield of tapioca	Correct (1)	/	Incorrect (0)
27.	Green manuring will increase the yield of tapioca	Yes (1)	/	No (0)
28.	What is the fertilizer recommendation for tapioca grown in your locality.	Correct (1)	/	Incorrect (0)
29.	At what time (stage of growth) will your apply fertilizer to tapioca	Correct (1)	/	Incorrect (0)
30.	Application of fertilizers in split dozes is beneficial for the tapioca crop.	Yes (1)	/	No (0)
31.	Weeding is required for tapioca	Yes (1)	/	No (0)
32.	What time weeding should be given for tapioca?	Correct (1)	/	Incorrect (0)
33.	State whether earthing up is required for tapioca	Yes (1)	/	No (0)

(contd...)

Appendix II A (contd..)

1	2	3
34	Irrigation for tapioca increases yield.	Yes (1) / No (0)
35	Name an important pest of tapioca in your locality	Correct (1) / Incorrect (0)
36	Name a control measure to prevent pests of tapioca	Correct (1) / Incorrect (0)
37	Name a pesticide used to control pests of tapioca.	Correct (1) / Incorrect (0)
38	Name an important disease of tapioca	Correct (1) / Incorrect (0)
39	Name the best harvest time of tubers	Correct (1) / Incorrect (0)
40	What is the average yield of M_4 tapioca variety.	Correct (1) / Incorrect (0)

APPENDIX II B

Difficulty indices and discrimination indices of the items of knowledge test

Sl.No. of the item as in Appendix III.	Frequencies of correct answers given by each group of respondents (N=1 0 for each group)		Total frequencies of correct answers (N = 30)	Difficulty index (P)	Discrimination index (E $^1/_3$)
	G_1	G_3			
1	2	3	4	5	6
1	10	9	19	63.33	0.10
2	9	7	16	53.33	0.20
*3	7	4	14	46.67	0.30
4	7	6	13	43.33	0.10
5	7	6	13	43.33	0.10
*6	10	7	17	56.67	0.30
7	10	9	19	63.33	0.10
* 8	7	1	8	26.67	0.60
9	2	1	3	10.00	0.10
* 10	9	5	14	46.67	0.40
* 11	9	4	13	43.33	0.50
12	2	1	3	10.00	0.10
13	1	0	1	3.33	0.10
14	1	0	1	3.33	0.10
15	2	1	3	10.00	0.10
16	10	9	19	63.33	0.10
17	10	6	16	53.33	0.40
18	9	8	17	56.67	0.10
19	5	0	5	16.67	0.50
20	10	9	19	63.33	0.10
* 21	9	1	10	33.33	0.80
22	4	0	4	13.33	0.40
* 23	8	2	10	33.33	0.60
* 24	8	0	8	26.67	0.80
* 25	9	3	12	40.00	0.60

(contd..)

Appendix II B (contd.)

1	2	3	4	5	6
*26	9	1	10	33.33	0.80
*27	9	5	14	46.67	0.40
28	1	0	1	3.33	0.10
29	2	0	2	6.67	0.20
30	3	0	3	10.00	0.30
31	10	9	19	63.33	0.10
32	10	9	19	63.33	0.10
*33	6	2	8	26.67	0.40
34	9	8	17	56.67	0.10
*35	9	0	9	30.00	0.90
36	3	0	3	10.00	0.30
37	1	0	1	3.33	0.10
38	9	8	17	56.67	0.10
*39	10	7	17	56.67	0.30
40	1	0	1	3.33	0.10

* Items selected for the test.

APPENDIX III

ADOPTION BEHAVIOUR OF TRIBAL FARMERS TOWARDS IMPROVED AGRICULTURAL PRACTICES

INTERVIEW SCHEDULE

Respondent No._____

Date _____

I. General

1. Name of the respondent:

2. Address

3. Age

4. Tribe

5. Settlement

6. Panchayat

7. Village

8. Block

9. Crops cultivated

Item	Crop	Area (in Ha)

II. Extent of knowledge about the improved agricultural practices:

Sl. No.	Item	Score
1.	Soils with rocky substrata are not suited for tapioca cultivation.	Yes (1) / No (0)
2.	Name the best time of harvest of the tubers	Correct (1) / Incorrect (0)
3.	Sandy soils are best suited for tapioca cultivation.	Yes (0) / No (1)

(contd..)

Sl. No.	Item	Score
4	Green manuring will increase the yield of tapioca	Yes (1) / No (0)
5	Name a high yielding variety of tapioca	Correct (1) / Incorrect (0)
6	Fertilizer should be applied to increase the yield of tapioca	Yes (1) / No (0)
7	Tapioca is an erosion resistant crop	Yes (0) / No (1)
8	What spacing is to be given for planting tapioca	Correct (1) / Incorrect (0)
9	Inter cropping is profitable in tapioca	Yes (1) / No (0)
10	Name a fertilizer that could be used to increase the yield of tapioca	Correct (1) / Incorrect (0)
11	Name an important pest of tapioca in your locality	Correct (1) / Incorrect (0)
12	Tapioca cannot withstand cold climate	Yes (1) / No (0)
13	Name a crop suitable for intercropping in tapioca	Correct (1) / Incorrect (0)
14	State whether earthing up is required for tapioca	Yes (1) / No (0)

III. Attitude towards farming

	Sl. No.	Statements	Agree	Undecided	Disagree
(-)	1	I feel farming is not a promising occupation			
(+)	2	Farming leads to overall development of one's family.			
(-)	3	Absolute gain in terms of economic returns from farming is very low.			
(+)	4	Farming is a challenge to tribals and they should accept it.			
(-)	5	Farming is not the solution to remove tribal poverty.			

(contd..)

Sl. No.	Statements	Agree	Undecided	Disagree
(-) 6	Farming is an occupation of rich people			
(-) 7	Farming is a non-profit enterprise and I feel it is useless to stick to it.			
(+) 8	Food problem of tribals can be solved by undertaking farming on a wide scale.			
(+) 9	Farming is a profitable occupation.			
(-) 10	Farming provides a settled living for tribals			

IV. Adoption of Improved Agricultural Practices:

I. Do you use improved tapioca setts for cultivation? Yes/ No

a) If yes, give the following details

No.	Variety	Area (in Ha)	Do you continue to use	If no, when discontinued	Reasons for discontinuing if any.	Perceived problems in adoption of recommended practices.
1	2	3	4	5	6	7

II. Do you use chemical fertilizers in your tapioca cultivation? Yes/ No

a) If yes, what are the chemical fertilizers used?

No	Variety	Name of the fertilizer	Quantity	Since when adopted	If no since when discontinued.	Do you contin use to use	Reason for discontinuing if any.	Perceived problems in adoption of recommended practices
1	2	3	4	5	6	7	8	9

III. What is the spacing you use for your tapioca setts planting? (Correct/ Incorrect)

IV a) Do you conduct weeding in your tapioca plot? (Yes / No)

b) Do you conduct earthing up in your tapioca plot? (Yes / No)

V Do you grow intercrops in your tapioca plot? (Yes / No)

a) If yes, give the following details:

No	Crop	Season	Variety	Area (ha)	Do you continue to use it	If no since when discontinued	Reason for discontinuing if any	Perceived problems in adoption of the recommended
1	2	3	4	5	6	7	8	9

V. Educational Status

Standard	Score (/)
Illiterate	(0)
Read only	(1)
Read and write	(2)
Primary	(3)
Middle school	(4)
High school & above	(5)

VI. Social participation

Please indicate whether you are a member or office bearer in the following organisation and if so, how frequently you attend the meeting.

Sl. No.	Organisation	As Member	As Office-bearer	Attend meeting		
				Regularly (3)	Occass-ionally (2)	Never (1)
1.	Panchayat					
2.	Cooperative Society					
3.	Rural Radio forum					
4.	Youth club					
5.	Distinctive features (MLA, MP. etc.)					
6.	Any other					

VII. Risk orientation

Statements	SA	A	VD	DS	SDA
(-) A farmer should grow large number of crops to avoid greater risks involved in growing one or two crops.	(1)	(2)	(3)	(5)	(7)
(+) 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.	(7)	(5)	(3)	(2)	(1)

Sl. No.	Statements	SA	A	VD	DS	SDA
(+) 3	A farmer who is willing to take greater risks than the average farmers usually do better financially.	(7)	(5)	(3)	(2)	(1)
(+) 4	It is good for a farmer to take risks when he knows his chance of success is fairly high.	(7)	(5)	(3)	(2)	(1)
(-) 5	It is better for a farmer not to try farming unless most other farmers have used them with success	(1)	(2)	(3)	(5)	(7)
(-) 6	Trying an entirely new method in farming by a farmer involves risk but it is worth it	(7)	(5)	(3)	(2)	(1)

VIII Economic Motivation

Sl. No.	Statements	Most like	Least like
A (a)	All I want from my farm is to make just a reasonable living for the family (1)		
(b)	In addition to making reasonable amount of profit, the enjoyment in farming life is also important for me (2)		
(c)	I would invest in farming to the maximum to gain large profit (3)		
B (a)	I would not hesitate to borrow any amount of money in order to run the farm properly (3)		
(b)	Instead of growing new cash crops which cost more money, I follow the routine farming practices (1)		
(c)	It is not only monetary profit, but also the enjoyment of work done, which gives me satisfaction for my hard work on the farming (1)		

Sl.No.	Statements	Most like	Least like
C (a)	I hate to borrow money on principles, even when it is necessary for properly running the farm (1)		
(b)	My main aim is maximising monetary profit in farming by growing cash crops in comparison to growing of crops which are simply consumed by my family (3)		
(c)	I avoid excessive borrowing of money for farm investigation (2)		

IX Fatalism:

Sl. No.		Statements	SA	A	DA	SDA
(-)	1	Those who say that they have seen Ghosts either distort the truth or tell a lie.	(1)	(2)	(3)	(4)
(-)	2	It is better to dis-believe in what is not proved or tested, but when tested it is to be relied on.	(1)	(2)	(3)	(4)
(+)	3	A basic tragedy is that man proposes, God disposes	(4)	(3)	(2)	(1)
(+)	4	Mantras have far reaching effects, if one can chant and recite accurately right mantras on right occuasion, he can produce miraculous effect	(4)	(3)	(2)	(1)
(+)	5	Every event in a man's life has already been settled and determined by his fate.	(4)	(3)	(2)	(1)

X Extent of Cosmopoliteness

Please indicate how frequently did you visit the nearest town and the purpose of your visit also.

A	Frequency of visit	Score	(/)
1.	Two or more times in a week	(5)	
2.	Once in a week a week	(4)	
3.	Once in fifteen days	(3)	
4.	Once in a month	(2)	
5.	Occasionally	(1)	
6.	Never	(0)	

B. Purpose of visit	Score	(/)
1. All visits relating to agriculture	(5)	
2. Some relating to agriculture	(4)	
3. Personal/ domestic matters	(3)	
4. Entertainment	(2)	
5. Other purpose	(1)	
6. No response	(0)	

XI Annual Income

Source	Rupees
1. Agriculture	
2. Minor forest products	
3. Farm labour	
4. Dairy/ Poultry	
5. Any others	
Total	

XII Status of Land tenancy

Tenancy status	Cultivable area (in Ha)
1. Cultivable land owned	
2. Cultivable land rented in	
3. Cultivable land rented out	
Total	

XIII Indebtedness

Source	Purpose of borrowing	Amount borrowed (in Rupees)	Terms
1			
2			
3			
4			
5			

Adoption Behaviour of Tribal Farmers Towards Improved Agricultural Practices

By

VIJU A.

ABSTRACT OF THE THESIS

submitted in partial fulfilment of
the requirement for the degree

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ABSTRACT

The research was conducted in Nedumangad taluk of Trivandrum district to study the adoption behaviour of tribal farmers.

The method of probability proportionate to sample size was followed for selecting 110 'Kanikkars'. Extent of knowledge about the improved agricultural practices, attitude towards farming and extent of adoption of improved agricultural practices were measured. The data were collected by interviewing using the interview schedule developed. Group discussions and participant observation were also made use of.

The study revealed the following:

Majority of the 'Kanikkars' had a medium level of knowledge about improved agricultural practices, a medium level of attitude towards farming and a low level of adoption.

Extent of knowledge about improved agricultural practices had positive association with educational status, social participation, risk orientation, cosmopoliteness and annual income. Fatalism had negative association with the extent of knowledge.

Attitude of tribal farmers towards farming had positive relationship with educational status, social parti-

cipation, risk orientation, economic motivation and annual income, whereas status of land tenancy was negatively correlated.

Extent of adoption of improved agricultural practices had positive association with educational status, economic motivation and annual income.

Step-wise regression analysis revealed that risk orientation, educational status, indebtedness, social participation and economic motivation contributed to 73 per cent of the variation in the extent of knowledge about improved agricultural practices.

Risk orientation, educational status, indebtedness, social participation, economic motivation, annual income and status of land tenancy contributed to 69.5 per cent of the variation in the attitude towards farming.

Risk orientation, economic motivation, indebtedness, annual income and educational status contributed to 62.8 per cent of the variation in the extent of adoption of improved agricultural practices. Risk orientation emerged as the most important variable in all the three regression analyses.

Path analysis done indicated that risk orientation had maximum direct effect on the extent of knowledge about

improved agricultural practices, attitude towards farming and extent of adoption of improved agricultural practices. Educational status and economic motivation were the crucial variables through which indirect effects were routed.

The major constraints in adoption of improved agricultural practices as perceived by the tribal farmers were: non-availability of inputs, inadequate financial assistance, damage to crops from wild pigs and elephants, lack of sufficient knowledge about the practices and exploitation by the middlemen.