ADOPTION OF DROUGHT MANAGEMENT PRACTICES BY FARMERS - A CRITICAL ANALYSIS

By

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THESIS

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D E C L A R A T I O N

I hereby declare that this thesis entitled "ADOPTION OF DROUGHT MANAGEMENT PRACTICES BY FARMERS - A CRITICAL ANALYSIS" 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.

Vellanikkara,
11th November, 1988.

Abdul Aziz, E

C E R T I F I C A T E

Certified that this thesis, entitled "ADOPTION OF DROUGHT MANAGEMENT PRACTICES BY FARMERS - A CRITICAL ANALYSIS" is a record of research work done independently by Sri. ABDUL AZIZ,E. under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to him.

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Introduction

CHAPTER-I

INTRODUCTION

"Agriculture in India is a gamble with monsoons"

Royal Commission on Agriculture, 1927.

Drought has been a constant visitor to India since time immemorial and especially to Kerala since 1982. Due to its tropical situation, erratic and uneven behaviour of monsoons' crops in India have been subject to failure, either partially or completely, resulting into the famine or conditions of scarcity. In common parlance, drought occurs where moisture in soil is not enough to allow a crop to grow. In India not only the tropical situation but its entire dependence on the monsoonal rainfall aggravates the situation of drought even more. The fact is further strengthened by the country's special tropical factors and pitiable state of development making agriculture a main business in the country. It contributes more than 50 per cent of the national income, supplies raw materials for a number of important industries and provides products for about 50 per cent of the country's foreign exchange earnings. The total area of India is 336 million hectares; of which 136 million hectares consists of sown area. Out of the total sown area, only about 23 per cent is at present under irrigation. The disturbing fact is that inspite of more than 35 years of planned

development of irrigation, about 77 per cent of the sown area is still dependent on rainfall.

Agriculture provides livelihood to over 70 per cent of the country's population. People's dependence on agriculture is such that when agriculture fails economy fails and the people, particularly the poor, starve. It has, therefore, aptly been stated that a drought in India means "a lockout in agricultural industry". Every year there will be sufficient rainfall to harvest a good crop if it is evenly distributed. Due to its unreliability and uncertainity Indian Agriculture has been subjected to frequent failures. Severe and wide-spread droughts have usually led to a sharp fall in food production and given rise to famine or scarcity condition.

Kerala's agriculture is unique in several aspects. The cropping pattern shows predominance of perennial cash crops like coconut, rubber, cashew, pepper, tea, coffee, cardamom and the like. The seasonal crops are paddy, banana, tapioca, ginger, minor tubers, vegetables etc. The cropping intensity is also high at 1.32. The contribution of the primary sector to the State income at current prices is estimated at 39 per cent during 1985-86 against 35 per cent for the country as a whole. It provides the raw materials for traditional industries like cashew processing, coir, oilmilling, sugar, handicrafts etc. Kerala is the major

producer of several agricultural commodities which earn valuable foreign exchange for the country either through exports or through import institutions.

It is interesting to observe that, inspite of the significance of agriculture in Kerala's economy, only 12 per cent of the cultivated area is under assured irrigation. With bountiful rains evenly distributed, this limitation had not acquired any major significance till a few years ago. But now the situation has become alarming due to consistent failure of the monsoons since early 1980's.

The monsoons in Kerala have been erratic for the past few years, exposing the state to the ravages of drought and occasional floods. The failures of south-west monsoon and north-east monsoon led the state to the severe drought condition. The drought situation in Kerala has several special features. Drought and its consequences in Kerala are very different in their manifestations from those of the other parts of the country such as Rajasthan, Uttar Pradesh, Bihar and Tamil Nadu. Although on an ad hoc basis, a number of package recommendations were channelled to the farmers of the State to manage the drought situation in crop cultivation. Major emphasis in this regard was accorded to Rice and Coconut crops, the torch bearers of Kerala's agricultural economy. Keeping in view the relevance and magnitude of drought management in Rice and Coconut

cultivation and since no research evidence is available about the adoption of these practices by the practicing farmers' in Kerala, the present research study was initiated with the following specific objectives:

i) to study the existing drought management practices followed by farmers for major crops (Rice and Coconut);

ii) to find out the knowledge level of farmers about recommended drought management practices;

iii) to find out the extent of adoption of recommended drought management practices by the farmers;

iv) to find out the awareness of the farmers about the drought proneness of crops and knowledge of the farmers about the parameters of drought;

v) to analyse the relationship between the socio-economic and psychological characters of the farmers with the extent of adoption of recommended drought management practices; and

vi) to identify the constraints experienced by the farmers in the adoption of drought management practices.

Need and importance of the study

The unique agricultural scenario in Kerala owes much to the agroclimatic endowments dominated by the rainfall pattern. While the total rains received during a particular year may be too little or too much, its distribution is very crucial. Total or almost total absence of rain during a

specific period or excessive rain in a short span of few days can cause real havoc to crops.

Although the state normally had good monsoon rains in the past, the monsoon had started behaving in a highly erratic manner from 1982 onwards. The current drought and the alarming situation created by it, are therefore, the cumulative effect of the relentless and consecutive droughts of the past five years. This has affected the crop sector most adversely.

The recurring drought situation in the state warrants a long-term action plan so as to ensure that agricultural production is not adversely affected to any appreciable extent. It is only with the intelligent management of crop husbandry practices, the farmers can combat the havoc caused by droughts. The agencies charged with the responsibility of developing and extending technology packages which can help the farmers to achieve economic agricultural production amidst failures of monsoon, have a crucial role to play in this respect. As a sequal to this, the Agricultural Research and Extension agencies in the State have recommended, though on an ad hoc basis in many cases, practices to combat drought situation in respect of various crops. An analysis of the awareness about and adoption of these practices by the farmers is essential to streamline the future endeavours in the State in this regard. The present study is an attempt in this direction.

Limitations of the study

All the Social Science Researches are subjected to certain constraints, this study is also not an exception. Apart from these limitations, this study has the following limitations:-

1. The findings of the study cannot be generalised over the entire State because the study area was limited to only one district in the State.

2. The limitation of time, finance and other resources available at the disposal of a single investigator.

3. The study is limited to only two crops namely rice and coconut since these crops are the major crops in the study area.

Nevertheless, it is hoped that this study would throw some useful light on the awareness and adoption of drought management practices for rice and coconut by the farmers which will help to streamline the future endeavours in the State in this regard.

Theoretical Orientation

CHAPTER-II

THEORETICAL ORIENTATION

A review of previous works, either theoretical or empirical, help in the delineation of new problem areas and provide a basis for developing a theoretical frame work for the study. This will also help in operationalising variables enabling data collection on the problems under investigation. The present study had the limitation of non-availability of directly related research studies. Though studies on the adoption of dryland technology were available, studies concerned with the adoption of drought management practices were very limited. However, an attempt has been made in this chapter to review the literature which had meaningful relation to the study. The reviews are presented under the following sections.

1. Concept of drought.
2. Technologies for drought management in rice and coconut cultivation.
3. Knowledge level of farmers about recommended drought management practices and parameters of drought.
4. Extent of adoption of drought management practices by farmers.
5. Awareness of the farmers about drought-proneness of crops.
6. Association between adoption and socio-personal and socio-psychological characteristics of farmers.

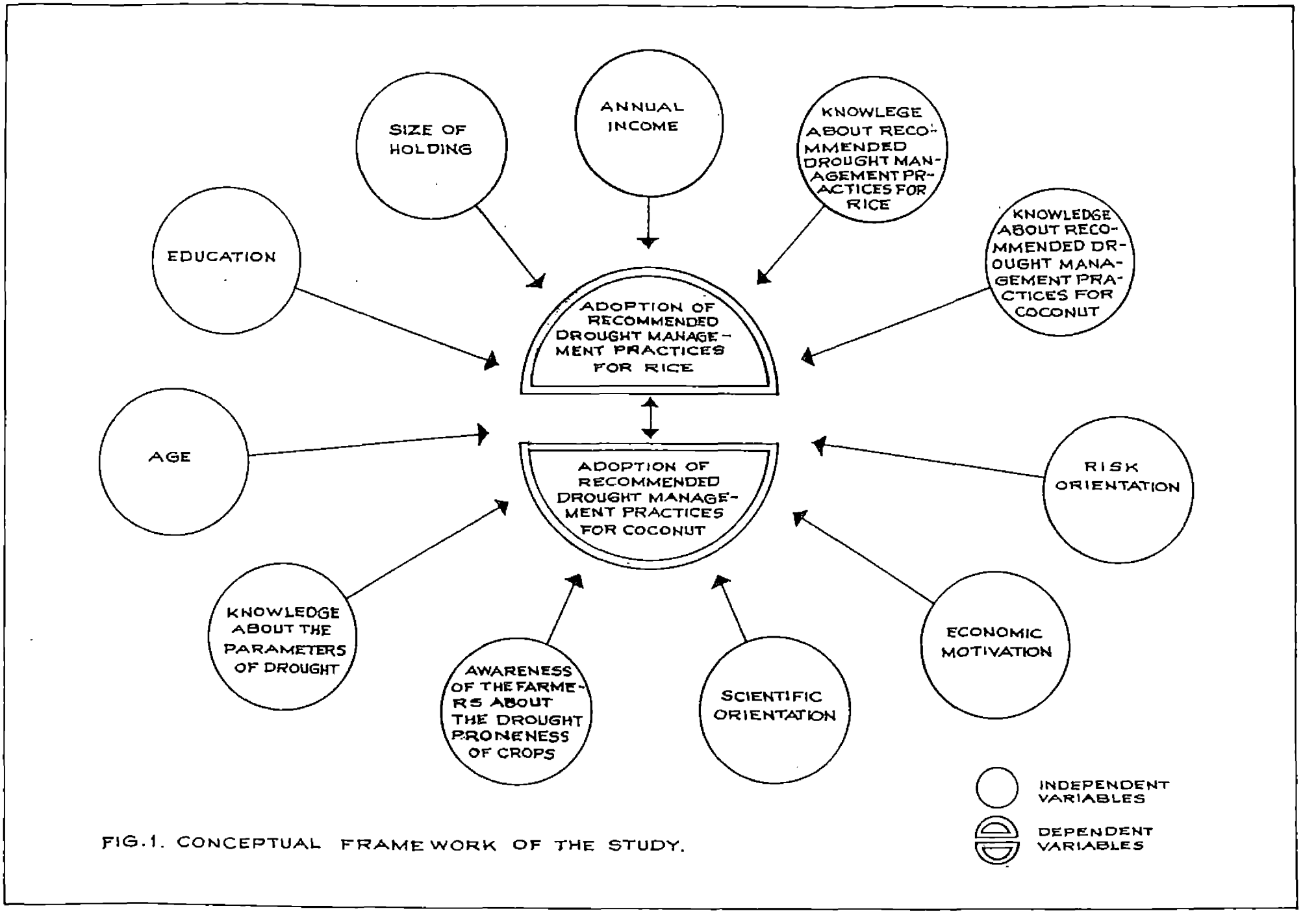


FIG.1. CONCEPTUAL FRAMEWORK OF THE STUDY.

7. Constraints experienced by farmers in adoption.
8. Theoretical concepts and operational definitions of the selected variables.
9. Hypotheses formulated for testing in the study.

1. Concept of drought

Many scientists and scientific institutions have defined 'drought' in various ways:

According to Tannehill (1947) drought belongs to the class of phenomenon which is popularly known as "spells of weather".

Thornthwaite (1948) has defined drought as a "period of dryness of weather or climate as affects the earth or prevents the growth of plants".

According to Ramadas (1950) drought is an occasion when the actual rainfall fell short of the normal by more than twice the mean deviation.

Landsberg (1958), however, differed drastically with all these definitions and said that drought is a biological rather than a climatic phenomenon, and that it should be defined separately for each plant species and soil environment.

Linsley et al. (1959) defined drought as a "sustained period of time without significant rainfall".

Thomas (1962) stated that "drought is a meteorological phenomenon and occurs when precipitation is less than the average and deficiency is great enough and long enough to hurt mankind".

Hofman et al. (1968) defined a drought year as "a year having less than 85 per cent of the normal precipitation : a period of atleast 21 days when the precipitation is less than 30 per cent of the normal".

The above reviews clearly indicates that drought is a meteorological phenomenon when the rainfall deviates considerably from what is normal which leads to animal and crop losses affecting human survival.

2. Technologies for drought management in rice and coconut cultivation

2.1. Rice

A Workshop on Drought Management Practices was conducted by the Kerala Agricultural University in April 1987. In this workshop it was recommended that in view of the fact that the third crop 'Punja' is likely to be affected by drought every year, the farmers may be advised to cultivate only short duration varieties like 'Triveni' and 'Annapoorna' during the third crop season.

It was also recommended that for the eastern part of Palghat district, where 'modan' system of paddy cultivation

is practised, varieties Ptb-29 and Ptb-30 will be more suitable to tolerate the drought condition during the first crop season.

2.2. Coconut

The Central Plantation Crops Research Institute (1987) recommended that with the receipt of late rains/showers the palm basins to a radius of 1.8m can be opened and mulching can be done in the basins. For mulching coir dust can be used wherever it is freely available and covered with soil.

The Workshop conducted by the Kerala Agricultural University (1987) also recommended husk burial as a regular practice in coconut gardens. Further, it was suggested in the Workshop that "where water is scarcely available, life saving irrigation can be practised".

Drip irrigation for adult palms and pitcher type with mud pots for seedlings were also advised by the Workshop as effective drought management practices for coconut cultivation.

3. Knowledge level of farmers about recommended drought management practices and parameters of drought

The studies regarding the knowledge of drought management practices were not much, but such studies on the knowledge of farmers about other farm practices including

dry farming practices are numerous. It will not be out of place to quote a few of them in order to get some insight into the knowledge of farmers regarding farm practices.

Viswanathan et al. (1975) found that the majority of the farmers had knowledge about age of seedlings and high yielding varieties of rice.

Bhilegaonkar (1976) concluded that a little over half of the farmer-respondents had medium level of knowledge with reference to fertilizer use. The study also revealed that 21.05, 22.22 and 18.41 per cent of big, medium and small farmers respectively belonged to high knowledge level whereas, 22.36, 25.00 and 28.94 per cent of big, medium and small farmers respectively were in low knowledge level category.

Anantharaman (1977) observed that the knowledge level of small farmers on high yielding varieties of jowar did not differ significantly from that of marginal farmers. The knowledge test revealed that 50 per cent of small farmers and 60 per cent of marginal farmers were below average while the rest were above average with respect to their levels of knowledge on high yielding varieties of jowar.

Vijayaraghavan (1977) reported that majority of small and marginal farmers possessed low level of knowledge about the high yielding varieties of paddy.

Mangalvedhar (1978) observed that beneficiary farmers of soil conservation,work lacked adequate knowledge on the

very important dry farming practices.

Mayani and Sheth (1978) reported that farmers' knowledge on Plant Protection was poor while it was fair on agronomic and manurial practices.

Kulkarni (1981) stated that about 60 per cent of the farmers had correct knowledge about paddy and wheat technologies.

Bhaskaram and Praveena (1982) reported that the recommended dry land practices about which a large number of respondents displayed high level of knowledge were off season tillage, mid season correction, correct time of sowing of dry land crops, soil mulching, improved seeds, correct seed rate, spacing, weeding and interculture. Those practices about which a large number of dry land farmers possessed medium level of knowledge were fertilizer use, intercropping and sequence cropping. The practices about which many farmers had low knowledge level were seed treatment, fertilizer spray of urea, chemical control of weeds, plant protection measures and improved agricultural implements.

Arumugam (1983) concluded that there was significant difference in the knowledge level of small and big farmers. Nearly 50 per cent in each category of small and big farmers possessed medium level of knowledge and 70 per cent of small and 31.67 per cent of big farmers had high level of knowledge.

Rajapandi (1983) reported that 66.67 per cent of wet land and garden land farmers possessed medium level of knowledge on water management practices.

Alexander (1985) stated that majority of the small rubber growers (63.64 per cent) were found to have medium level of knowledge, while 22.72 per cent and 13.64 per cent of the small growers had high and low level of knowledge respectively. He also concluded that there was significant difference between the knowledge level of trained and untrained farmers.

4. Extent of Adoption of Drought Management Practices by farmers

Research studies on adoption of drought management practices were not much. Therefore, studies on adoption of other agricultural technologies by farmers are reviewed hereunder.

Sundaraswamy and Duraiswamy (1975) pointed out that 40 per cent of the ragi farmers applied recommended dose of fertilizers while 51 per cent applied the fertilizers at different levels.

Somasundaram (1976) reported that there was wide variation in the extent of adoption of different practices in paddy except seed rate and area under nursery by the small farmers.

Vijayaraghavan (1977) identified wide variation in the extent of adoption of high yielding variety paddy for all practices among marginal farmers. He also reported wide variation in the extent of adoption of all practices by small farmers except seed rate.

Rajendran (1978) found that majority of the small farmers were either low or medium adopters of improved rice technology.

Chandrasekharan (1979) reported that majority (70 per cent) of the registered sugarcane growers were medium level of adopters followed by high level (21.5 per cent) adopters, while only 12.50 per cent were low adopters of recommended practices.

Ravichandran (1980) reported that majority of the respondents (63.34 per cent) had medium level of adoption of package of practices. He also pointed out to the wide variation in the extent of adoption of package of practices.

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

Rajapandi (1983) found that about 73 per cent of wet land farmers and 75 per cent of garden land farmers had medium level of adoption of water management practices.

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

Viju (1985) reported that majority of the tribal farmers were low adopters of improved agricultural practices.

5. Awareness of the farmers about drought-proneness of crops

In the absence of studies on awareness of drought-proneness of crops, studies conducted on the awareness of other agricultural development programmes are reviewed hereunder.

Gosh and Reddy (1978) conducted a study on the attitude of farmers and agricultural extension workers towards T & V System in West Bengal and reported that majority of the farmers and contact farmers belonged to the category of below mean value in terms of their awareness on different aspects of T & V system. Although most of the officials were aware of T & V system, majority of them did not know about the day of visit of the other functionaries.

Jaiswal et al. (1978) conducted a comparative study of T & V system in Madhyapradesh and Rajasthan and observed that eventhough a vast majority of contact farmers know the day of visit of village level workers, about 65 per cent of them were not knowing the concept of contact farmers.

Rao and Reddy (1979) conducted an evaluative study on the impact of T & V system in Andhrapradesh and reported that almost all the farmers were aware of the term 'contact farmers' and also the year of inception of T & V system. Majority of the farmers were knowing the village extension officers and Assistant Agricultural Officers by name and person but they did not know the Assistant Director of Agriculture and Deputy Director. None of them were aware of the actual number of contact farmers in their T & V unit. Almost all the farmers were not aware of the day to visit of village extension officers and their frequency of visit.

Vijayaraghavan (1979) reported that awareness of Integrated Dryland Agricultural Development Programme amongst participants was medium to high while the same for non-participants was low to medium.

Rao and Reddy (1980) in his study on inter-personal communication behaviour of farmers in Sreeram Sagar Command Area of Andhrapradesh found that majority of farmers were aware of T & V system.

Salunkhe (1980) found that awareness about SFDA contributed significantly to the involvement of small farmers.

Sarkar and Reddy (1980) studied the impact of T & V system in West Bengal and reported that all the farmers

were aware of the term 'contact farmers' and most of them were aware of the year of inception of T & V system. Most of them knew the village extension workers and agricultural extension officers and their days of visit. It was also stated that between the contact farmers and non-contact farmers, the contact farmers had better awareness about T & V system.

6. Association between adoption and socio-personal and socio-psychological characteristics of farmers

In the absence of direct studies on the subject, a few studies regarding other farm practices are reviewed below.

6.1. Age

Sevenson (1942) found that younger farmers adopted the innovations before other farmers.

Pandit (1964) reported that age was positively related with adoption.

Appa Rao (1971) reported that age of farmers was not associated with adoption of demonstrated practices.

Anbalagan (1974) found that young farmers accepted more number of improved agricultural practices for high yielding varieties of paddy than older farmers.

Somasundaram (1976) found that age was negatively correlated with the adoption of IR-20 paddy in respect of small farmers.

Pillai (1978), while studying the impact of soil conservation programme, found that age was negatively and significantly related with adoption of soil conservation practices.

Manivannan (1980) reported that age was negatively and significantly correlated with extent of adoption of practices.

6.2. Education

Nair (1969), Bhaskaran (1978) and Ravi (1979) observed that education had no significant relationship with adoption.

Sundaraswamy (1971) stated that education had significant influence on the adoption behaviour of hybrid jowar growers.

Many researchers have established positive relationship between education and adoption of improved agricultural practices by farmers Hussain (1971), Perumal and Duraiswamy (1972), Ramamoorthy (1973). Similar results were also obtained by Raju (1978), Prasad (1978) and Sinha and Sinha (1980).

Viswanathan (1972) and Somasundaram (1976) in their studies observed that education was positively associated with adoption.

Supe and Salode (1975) reported that formal education had no significant relationship with the adoption of demonstrated farm practices.

Palaniswamy (1978) stated that education did not have any significant association with the extent of adoption.

Agarwal (1984) found that better educated farmers were generally early adopters of innovations.

6.3 Size of holding

Sharma (1969) observed that the size of the farm had no effect on consumption of fertilizers.

Acharya (1970) recorded significant and positive association between farm size and adoption.

Oliver (1971), Chandrakandan (1973), Ramamoorthy (1973) and Anbalagan (1974) reported that farm size had positive and significant association with extent of adoption of farm technology.

Sharma and Nair (1974) found that size of holding was positively and significantly related to adoption. Similar results were also obtained by Srinivasan (1974) and Raju (1978).

But, Supe and Salode (1975), Ravi (1979) and Sinha and Sinha (1980) did not find any association between farm size and adoption.

Viswanathan, et al. (1975) stated that there was significant influence of farm size on the adoption of high yielding varieties of paddy by farmers.

Vijayaraghavan (1976) concluded that farm size was positively and significantly associated with adoption of high yielding varieties of paddy.

Pillai (1978) also reported that farm size had influence over adoption of improved practices.

6.4. Annual Income

Perumal and Duraiswamy (1972) found that the cultivation of Hybrid maize was strongly and positively related to the income of farmers.

Chandrakandan (1973) stated that farmers with more income were found to be better adopters.

Ramamoorthy (1973) concluded that the gross income was positively associated with the adoption of NPK fertilizers.

Pillai (1978) observed positive and significant relationship between income and adoption of soil conservation measures by farmers.

6.5. Risk orientation

Singh (1968) found positive and significant influence between risk orientation and adoption.

Nair (1969), while conducting a multi-variate study on the adoption of high yielding paddy varieties by the

farmers of Kerala, found risk orientation as an important variable which affected the adoption behaviour.

Singh and Singh (1970) also reported similar relationship.

Many researchers had established positive and significant association between risk orientation and adoption behaviour of the farmers/Tripathy (1977), Rajendran (1978), Binswanger (1978), Kamarudeen (1981) and Pillai (1983)/.

6.6. Economic motivation

Hobbs (1964) reported that there was positive relationship between the economic motivation of farmers and their adoption behaviour.

Beal and Sibley (1967) and Singh (1968) reported positive relationship between economic motivation and adoption of improved practices.

Nair (1969) revealed that economic motivation was positively and significantly related with adoption of high yielding variety paddy by the farmers. Similar results were obtained by Singh and Singh (1970) and Rajendran (1978).

Sohal and Tyagi (1978) and Haque and Ray (1983) also had reported that economic motivation was significantly related with adoption of improved practices.

6.7. Scientific Orientation

Beal and Sibley (1967) found that farmers' favourable attitude towards science was positively related with the adoption of farm practices.

Reddy and Kivlin (1968) observed that scientific attitude was not related with the adoption of recommended practices by the farmers.

Supe and Salode (1975) reported that the scientifically oriented farmers had high extent of adoption of the demonstrated cultivation practices of Jowar.

6.8. Knowledge about recommended drought management practices for rice, coconut and parameters of drought

One of the main tasks in extension education is to provide or improve the knowledge of the people about the improved practices, because knowledge as a component of behaviour plays an important role in the total behaviour of individuals. Greater knowledge of improved practices would lead to higher adoption, it is often hypothesised.

No closely related studies could be reviewed on the relationship between knowledge about recommended drought management practices for rice, coconut and parameters of drought and extent of adoption of recommended drought management practices for rice and coconut.

Nimje (1975) found that the farmers's personal and situational characteristics were related to their knowledge level and knowledge level was related to the adoption behaviour of the farmers.

Janakiramraju (1978) reported that knowledge of farmers was positively and significantly associated with their extent of adoption of fertilizers in both irrigated and non-irrigated areas.

Deepali (1979) revealed that there was positive relationship between level of knowledge of rural women in farm practices and their degree of participation in agricultural operations.

Pillai (1983) pointed out that the farmers with low technological gap had more knowledge about soil conservation practices.

6.9. Awareness of the farmers about the drought-proneness of crops

No studies on the influence of awareness of the farmers about drought proneness of crops on extent of adoption of recommended drought management practices for rice and coconut could be traced out.

7. Constraints experienced by farmers in adoption

Sundaraswamy (1971) reported that lack of knowledge and lack of money were the main reasons for non-adoption of

recommended farm practices.

Viswanathan (1972) concluded that high cost of cultivation expenses and lack of conviction were the reasons for non-adoption.

Rao (1972) found that non-availability of inputs was the main problem faced by the users of farm machinery.

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

Vijayaraghavan (1977) stated that non-adoption of all the recommended package of practices was due to inadequate irrigation facilities.

Sripal (1981) reported that the factors responsible for the non-adoption of improved practices in cotton cultivation were high cost and lack of knowledge.

Bhaskaram and Praveena (1982) reported that the most common reasons for non-adoption of dry farming practices were lack of knowledge about the practices, practices not being practicable and lack of proper guidance.

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.

Bhoite and Nikalje (1983) listed out the following factors responsible for the non-adoption of dry land technologies: in-adequacy of capital, lack of knowledge, non-availability of technical guidance, non-availability of seeds, fertilizers, pesticides etc., lack of improved implements, inadequacy of labour, uneconomic holdings and in-adequacy of rain.

8. Theoretical concepts and Operational Definitions of the Selected variables

8.1. Adoption

Wilkening (1952) postulated adoption of an innovation as a process composed of learning, deciding and action over a period of time.

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

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

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

For the purpose of this study, the term adoption was operationally defined as the extent of utilization of recommended drought management practices for rice and coconut by the respondent-farmers.

8.2. Knowledge

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

Operationally, knowledge is defined as the body of information possessed by the respondent-farmer with respect to the drought management practices of rice and coconut and parameters of drought.

8.3. Age

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

8.4. Education

Pillai (1978) defined the term "educational status" as the number of years of formal school or college studies undergone by an individual. This definition is adopted in the present study also.

8.5. Risk orientation

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

8.6. Economic motivation

Nair (1969) defined economic motivation of farmers as their attitude towards farming as a profit oriented enterprise. The same definition was adopted for the present study also.

8.7. Scientific orientation

According to Supe (1969), scientific orientation is the degree to which a farmer is oriented to the use of scientific methods in decision making in farming. The same operational definition was adopted in this study.

9. Hypotheses set for the study

Based on the theoretical orientation and the review of literature, the following null hypotheses were formulated for testing in the study.

Ho-1 There would be no significant difference in the farmers' knowledge about recommended drought management practices for rice and coconut.

Ho-2 There would be no significant difference in the farmers' adoption of recommended drought management practices for rice and coconut.

Ho-3 There would be no significant relationship between age of farmers and their adoption of recommended drought management practices for rice.

Ho-4 There would be no significant relationship between education of farmers and their adoption of recommended drought management practices for rice.

Ho-5 There would be no significant relationship between size of holding of farmers and their adoption of recommended drought management practices for rice.

Ho-6 There would be no significant relationship between annual income of farmers and their adoption of recommended drought management practices for rice.

Ho-7 There would be no significant relationship between knowledge of farmers about recommended drought management practices of rice and their adoption of recommended drought management practices for rice.

Ho-8 There would be no significant relationship between knowledge of farmers about recommended drought management practices of coconut and their adoption of recommended drought management practices for rice.

Ho-9 There would be no significant relationship between risk orientation of farmers and their adoption of recommended drought management practices for rice.

Ho-10 There would be no significant relationship between economic motivation of farmers and their adoption of recommended drought management practices for rice.

Ho-11 There would be no significant relationship between scientific orientation of farmers and their adoption of recommended drought management practices for rice.

Ho-12 There would be no significant relationship between awareness of the farmers about the drought-proneness of crops and their adoption of recommended drought management practices for rice.

Ho-13 There would be no significant relationship between knowledge of farmers about parameters of drought and their adoption of recommended drought management practices for rice.

Ho-14 There would be no significant relationship between the farmers' extent of adoption of recommended drought management practices for coconut and their adoption of recommended drought management practices for rice.

Ho-15 There would be no significant relationship between age of farmers and their adoption of recommended drought management practices for coconut.

Ho-16 There would be no significant relationship between education of farmers and their adoption of recommended drought management practices for coconut.

Ho-17 There would be no significant relationship between size of holding of farmers and their adoption of recommended drought management practices for coconut.

Ho-18 There would be no significant relationship between annual income of farmers and their adoption of recommended drought management practices for coconut.

Ho-19 There would be no significant relationship between knowledge of farmers about recommended drought management practices of rice and their adoption of recommended drought management practices for coconut.

Ho-20 There would be no significant relationship between knowledge of farmers about recommended drought management practices of coconut and their adoption of recommended drought management practices for coconut.

Ho-21 There would be no significant relationship between risk orientation of farmers and their adoption of recommended drought management practices for coconut.

Ho-22 There would be no significant relationship between economic motivation of farmers and their adoption of recommended drought management practices for coconut.

Ho-23 There would be no significant relationship between scientific orientation of farmers and their adoption of recommended drought management practices for coconut.

Ho-24 There would be no significant relationship between awareness of farmers about the drought proneness of crops and their adoption of recommended drought management practices for coconut.

Ho-25 There would be no significant relationship between knowledge of farmers about parameters of drought and their adoption of recommended drought management practices for coconut.

Ho-26 There would be no significant relationship between extent of adoption of recommended drought management practices for rice and their adoption of recommended drought management practices for coconut.

Methodology

CHAPTER-III

METHODOLOGY

This Chapter deals with the research methods and procedures followed in this study and consists of the following sections.

I. Locale of the research study.

II. Operationalisation of the variables and their measurements.

III. Method of data collection.

IV. Statistical tools used.

I. Locale of the research study

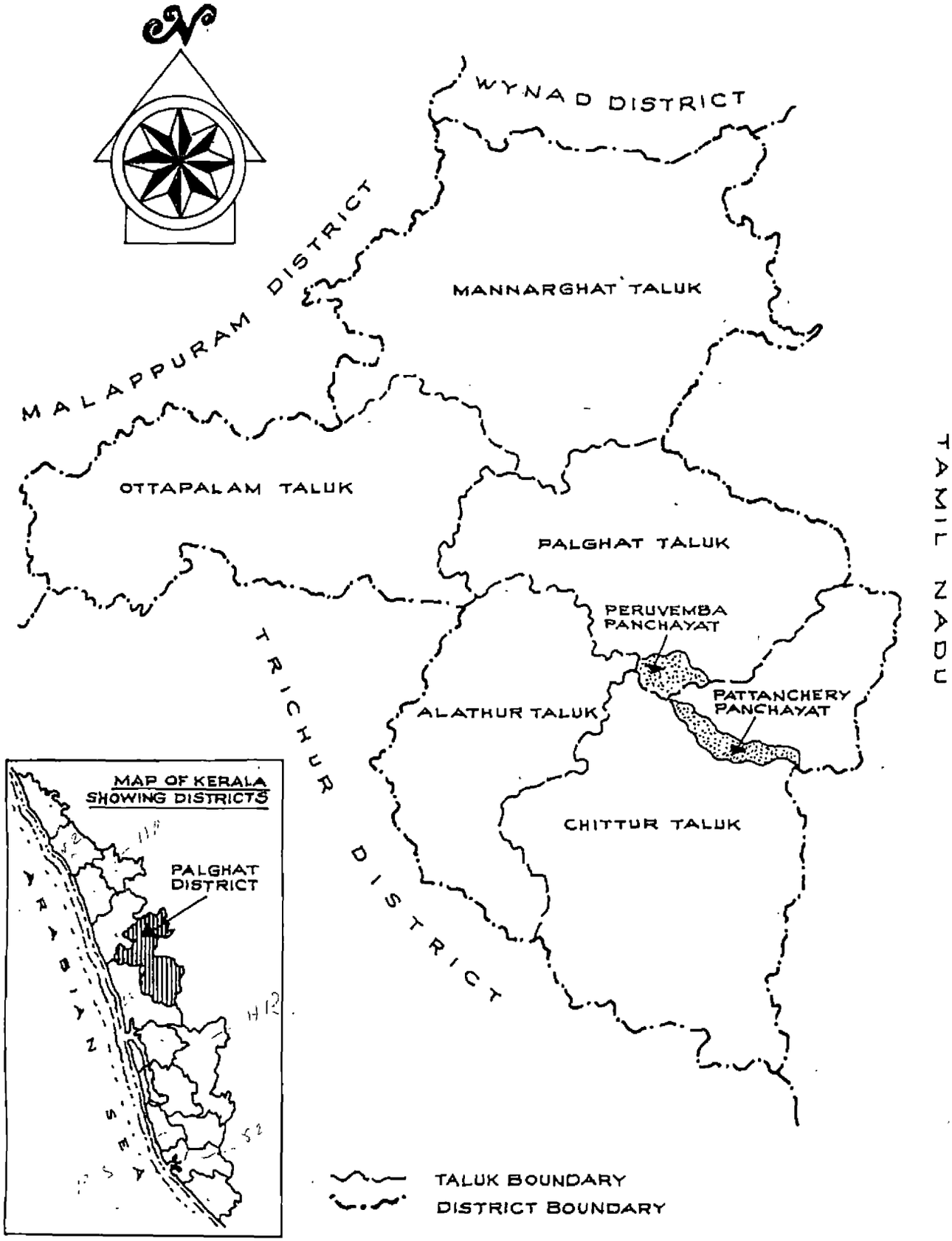
i) Selection of the district

Among the 14 districts of Kerala, Palghat district was purposively selected for the study for the following reasons.

a) Palghat district has the maximum area under semi-arid condition.

b) Out of the 84957 hectares of rice area in the district, 74672 hectares are unirrigated which makes the district the most drought-prone district in the State. (Source: Farm Guide 1988, Farm Information Bureau, Government of Kerala).

FIG. 2. MAP OF PALGHAT DISTRICT SHOWING THE PANCHAYATS SELECTED FOR THE STUDY.



c) The crop loss due to drought in respect of rice in this district is the maximum (91974 MT) as reported by the Government of Kerala. (Source: Memorandum presented to the Government of India for drought relief measures by Government of Kerala, 1987).

ii) Selection of the agricultural sub-division

Out of the four agricultural sub-divisions of Palghat district, Chittoor agricultural sub-division was purposively selected for the study in view of the following reasons.

a) Among the four agricultural sub-divisions in Palghat district, Chittoor had the maximum area with semi-arid nature.

b) Rainfed agriculture is the predominent feature in this sub-division.

c) Distribution of rainfall in this agricultural sub-division is the poorest, since it comes under the rain-shadow belt.

d) The Operational Research Project For Resources Development on watershed basis implemented by the Kerala Agricultural University is functioning with headquarters at Ozhalapathy situated in the Chittoor agricultural sub-division.

iii) Selection of the panchayaths

Chittur agricultural sub-division consists of 26

panchayats and two municipalities. Out of these, two panchayats, namely Pattencheri and Peruvamba were randomly selected.

iv) Selection of the respondents

The list of farmers cultivating rice and coconut were obtained from the respective panchayats. From each panchayat three wards were selected at random and from each ward 20 respondents were randomly selected. Thus, the present study was conducted among the 120 respondents selected from these panchayats as illustrated in Table 1.

Table 1. Distribution of respondents in the selected panchayats

Sl. No.	Name of the Panchayat	Number of farmers having rice and coconut cultivation				Sample Size			
		Ward I	Ward II	Ward III	Total	Ward I	Ward II	Ward III	Total
1.	Pattenchery	142	181	160	483	20	20	20	60
2.	Peruvemba	114	125	147	386	20	20	20	60
	Total	256	306	307	869	40	40	40	120

v) Description of the study area

Chittoor, the South-Eastern taluk of Palghat district is bounded on the north by the Palghat taluk, on the east by the Pollachi taluk of Coimbatore district, on the south by the Mukundapuram taluk of Trichur district

panchayats and two municipalities. Out of these, two panchayats, namely Pattencheri and Peruvamba were randomly selected.

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and on the west by the Alathur taluk. This taluk is situated in the centre of the Palghat gap and hence the meteorological conditions are very similar to the adjoining Coimbatore district of Tamil Nadu State. The average annual rainfall is 998 mm. Rice and coconut are the major crops with 29,906 ha and 9292 ha under these crops, respectively.

The other crops that are grown in this area are groundnut, pulses, cotton and sugarcane. The details of area under rice and coconut in the selected panchayats are furnished in Table 2.

Table 2. Area under rice and coconut in the selected panchayats

Sl. No.	Panchayat	Total area under cultivation in ha	Area Under	
			Rice (ha)	Coconut (ha)
1.	Pattenchery	3126	1518	716
2.	Peruvemba	2417	1217	619

II. Operationalisation of the variables and their measurements

A. Methodology of assessing the existing drought management practices for rice and coconut followed by the farmers.

B. Dependent Variable

Since the main objective of the study was to

ascertain the adoption of drought management practices for rice and coconut by the farmers, this variable was considered as the dependent variable for the study.

C. Independent Variables

The following socio-personal and socio-psychological characteristics of the farmers were treated as the independent variables.

1. Age.
2. Education.
3. Size of holding.
4. Annual income.
5. Knowledge about recommended drought management practices for rice.
6. Knowledge about recommended drought management practices for coconut.
7. Risk orientation.
8. Economic motivation.
9. Scientific orientation.
10. Awareness of the farmers about the drought proneness of crops.
11. Knowledge about the parameters of drought.
12. When adoption of drought management practices for rice becomes the dependent variable, adoption of drought management practices for coconut becomes an independent variable and vice-versa.

D. Constraints perceived by the farmers in the adoption of drought management practices

The procedures followed in quantifying the above

variables are outlined hereunder:

A. Methodology of assessing the existing drought management practices for rice and coconut

The respondent-farmers were individually asked to indicate the nature of drought management practices followed by them for the cultivation of rice and coconut. Their responses were codified and frequency and percentages were worked out to express the extent of adoption of these practices by the farmer - respondents.

B. Dependent variable

Adoption of drought management practices for rice and coconut

Wilkening (1952) measured adoption by using an index. The index of adoption used was the percentage of practices adopted to the total number of practices applicable for that farmer.

Duncan and Kreetlow (1954) used a 25-item index of farm practices adoption which was a modification of the index developed by Wilkening.

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

Fliegel (1956) constructed an index of adoption of farm practices using the correlation of several adoption

variables. He used factor analysis of each of the 11 factors selected. A score of one was given for adoption and zero for non-adoption.

Beal and Rogers (1960) studied in detail the adoption of two farm practices. A simple adoption scale was developed which credited the individual with one point for adoption and zero for non-adoption of a practice.

Chattopadhyaya (1963) considered potentiality, extent of adoption, weightage of each practice and time taken in developing an adoption quotient.

Jaiswal and Dave (1972) developed an adoption quotient with the components such as extent of adoption and potentiality of each practices.

In the present study the method developed by Beal and Rogers (1960) was followed for measuring the extent of adoption of recommended drought management practices for rice and coconut. The drought management practices were evolved based on the Workshop on Drought Management Practices conducted by the Kerala Agricultural University in April 1987. There were six practices for rice and seven practices for coconut.

The scoring was done by giving one score for each recommended drought management practice, if it was adopted completely by the respondents and zero was given for no

adoption. Thus the maximum score possible for a respondent was six in the case of rice and seven for coconut and the minimum being zero in both cases.

On the basis of the adoption score obtained by the respondents for rice and coconut they were categorised by using the confidence limits.

Low - (Less than mean -1SD)

Medium - (Between mean ± 1SD)

High - (Greater than mean +1SD)

C. Independent variables

1. Age

Age was measured as the number of years the respondent has completed at the time of the investigation since his birth.

2. Education

Education was operationalised as the number of formal years of education an individual received. The score was assigned as per socio-economic status scale of Trivedi (1963) with slight modifications to suit the Kerala conditions.

Level of education	Score
Illiterate	0
Can read only	1
Can read and write only	2
Upto lower primary	3
Upto upper primary	4
Upto secondary	5
Above secondary	6

3. Size of holding

Farm size referred to the number of hectares owned and cultivated by an individual at the time of interview. The area expressed in hectares was taken as such.

4. Annual income

Annual income refers to the total gross income of an individual earned during a year through agriculture and other occupations.

The range of income in the study area was taken into consideration while classifying the respondents into four categories and the scores were assigned as follows:

Level of income	Score
Upto Rs. 2000	1
Rs. 2001 to Rs. 4000	2
Rs. 4001 to Rs. 6000	3
Above Rs. 6000	4

5. Knowledge about recommended drought management practices for rice

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

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

Shankariah and Singh (1967) measured knowledge of the respondents about improved methods of vegetable cultivation based on Teacher-made test.

Nair (1969) measured knowledge level of farmers on recommended package of practices for rice using Teacher-made-test with multiple choice questions. This method was followed by Kamarudeen (1981) and Syamala (1988).

Singh and Prasad (1974) measured knowledge by working out knowledge quotient, calculated as follows:

$$*\text{Knowledge Quotient} = \frac{\text{Obtained knowledge score}}{\text{Actual total score}} \times 100$$

In this study the method used by Syamala (1988) based on the procedure developed by Nair (1969) was used to measure the knowledge on recommended drought management practices for rice.

Method of scoring

Six items were included in the knowledge test. These items were evolved based on the recommendations of the Workshop on Drought Management Practices conducted by the Kerala Agricultural University. Each respondent was given one score for correct answer and zero score for incorrect answer. The total knowledge score for each respondent was calculated by summing up the scores for each item. Thus, the maximum knowledge score that could be obtained by a respondent was six and the minimum that could be obtained was zero.

On the basis of the knowledge score obtained by the respondent for rice, it was categorised by using the confidence limits.

Low - (Less than mean -1SD)

Medium - (Between mean $\pm$1SD)

High - (Greater than mean +1SD)

6. Knowledge about recommended drought management practices for coconut

Here also, a similar procedure as in the previous case was adopted, the details of which are outlined as follows:

Method of scoring

Seven items were included in this knowledge test. These items were evolved based on the recommendations of the Workshop on Drought Management Practices conducted by the Kerala Agricultural University. Each respondent was given one score for correct answer and zero score for incorrect answer. The total knowledge score for each respondent was calculated by summing up the scores given for each items. Thus, the maximum knowledge score that could be obtained by a respondent was seven and the minimum that could be obtained was zero.

On the basis of the knowledge score obtained by the respondent for coconut, it was categorised by using the confidence limits,

Low	-	(Less than mean -1SD)
Medium	-	(Between mean $\pm$ 1SD)
High	-	(Greater than mean +1SD)

7. Risk orientation

In this study the scale developed by Supe (1969) was used to measure the risk orientation of the respondents. The scale consisted of six statements of which two were negative. The responses were collected on a five-point continuum as shown below:

Points in the continuum	Score
Strongly agree	7
Agree	5
Undecided	4
Disagree	3
Strongly disagree	1

The scoring pattern was reversed for negative statements. The total score thus obtained by an individual was taken as his score for risk orientation.

8. Economic motivation

The economic motivation scale developed by Supe (1969) was used for this study. The scale consisted of six statements of which the last one was negative. The response pattern and scoring procedure followed was similar to that of risk orientation scale. The total scores thus obtained by an individual was taken as his score for economic motivation.

9. Scientific orientation

It was quantified with the help of the scale developed by Supe (1969) which was followed by Syamala (1988) also. The scale consisted of six statements of which one was negative. The scoring procedure was followed as described under risk orientation scale. The total score thus obtained by an individual was taken as his score for scientific orientation.

10. Awareness of the farmers about the drought-proneness of crops

Naik (1981) studied the awareness of respondents about T & V system by asking a number of questions on several aspects of the system. The scoring index developed for the purpose of the study was used as a guideline to score each response. By summing up these scores on individual items the total score on awareness was obtained. This method was followed by Betty Cherian (1984).

In this study, the procedure adopted by Naik (1981) was followed to measure the awareness of respondents about drought-proneness of crops. Some statements regarding the drought-proneness of rice and coconut were prepared in consultation with Agronomists of the Kerala Agricultural University, field extension personnel of the Department of Agriculture and the literature available and the farmers were

asked to indicate whether they agree or disagree with the statements, and score 'one' was given for 'agree' and 'zero' for 'disagree' responses for the statements.

The total scores were added up and the total score on awareness was obtained for farmers. On the basis of scores obtained the means and standard deviations were worked out and the respondents were categorised into three groups as follows:

Low - (Less than mean -1SD)
Medium - (Between mean ±1SD)
High - (Greater than mean +1SD)

11. Knowledge about the parameters of drought

In this study, the procedure used by Syamala (1988) based on the method developed by Nair (1969) was made use of to measure the farmers' knowledge about the parameters of drought.

Six statements regarding the parameters of drought were prepared in consultation with the Meteorologists of the Kerala Agricultural University, Extension personnel of the Kerala State Department of Agriculture, and the literature available, and the respondents were asked to check the statements. Each respondent was given one score for correct answer and zero for incorrect answer. The total

knowledge score for each respondent was calculated by summing up the scores given for each item. Thus, the maximum knowledge score that could be obtained by a respondent was six and the minimum was zero.

On the basis of the knowledge score obtained by the respondents, they were categorised by using the confidence limits.

Low - (Less than mean -1SD)

Medium - (Between mean $\pm$1SD)

High - (Greater than mean +1SD)

D. Constraints perceived by the farmers in the adoption of drought management practices

Based on the discussions with the farmers and review of literature, a list of eight constraints experienced by the farmers in the adoption of drought management practices was prepared. The respondents were asked to rank the problems in the order of their importance as perceived by them. A score of eight was given for the constraint ranked first, seven, for the second, six for the third, five for the fourth, four for the fifth, three for the sixth, two for the seventh and one for the eighth. The constraints-wise total scores were worked out by cumulating the scores assigned by each respondent to each constraint. A constraint index was calculated for each constraint by dividing the total score by

the number of respondents ie. 120. Further ranking of individual constraints was done based on the constraint index.

III. Method of data collection

The data were collected during February and March 1988. For this purpose, a well structured interview schedule was prepared after perusal of available literature and through consultation with experts in the field of extension education and other related fields. The schedule was pre-tested in a non-study area and the final schedule was modified to suit the study area and research work. The data collection was undertaken by the researcher himself by personally contacting the respondents at their convenience. The collected data were subjected to statistical analyses listed below.

IV. Statistical tools employed in the analyses

In consultation with experts in the field of statistics and extension education, the following statistical tools were used for analysis.

i) Mean and standard deviation

In this method $\pm$ one standard deviation was used wherever necessary to classify the respondents into different categories. Mean + one standard deviation indicated high

level, mean - one standard deviation referred to low level, the range in between indicated the medium level.

ii) Frequency and percentages

Some of the data were subjected to and interpreted in terms of frequency and percentages.

iii) Cochran and Cox test

This test was used for comparing two means, when the sample variance differed significantly.

iv) Simple correlation

The correlation co-efficients were computed to find out the relationship between the dependent and independent variables and also to find out the correlation between the independent variables.

v) Path analysis

Path co-efficient was worked out as explained by Wright, . (1923) to find out the influence as well as the direct and indirect effects of the independent variables on extent of adoption of recommended drought management practices for rice and coconut.

Results and Discussion

CHAPTER-IV

RESULTS AND DISCUSSION

The results and discussion of the investigation are presented in this Chapter under the following sections:

1. Existing drought management practices followed by the respondents for rice cultivation.
2. Existing drought management practices followed by the respondents for coconut cultivation
3. A. Level of knowledge of the respondents about recommended drought management practices for rice.
   B. Knowledge of the respondents about different types of recommended drought management practices for rice.
4. A. Level of knowledge of the respondents about recommended drought management practices for coconut.
   B. Knowledge of the respondents about different types of recommended drought management practices for coconut.
5. Comparison of mean scores of the respondents on their knowledge about recommended drought management practices for rice and coconut.
6. A. Level of adoption of recommended drought management practices for rice.
   B. Adoption of different types of recommended drought management practices for rice by the respondents.
7. A. Level of adoption of recommended drought management practices for coconut by the respondents.
   B. Adoption of different types of recommended drought management practices for coconut by the respondents.

8. Comparison of mean scores of the respondents on their adoption of recommended drought management practices for rice and coconut.

9. Level of awareness of the respondents about the drought proneness of crops.

10. Level of knowledge of the respondents about the parameters of drought.

11. Relationship of the independent variables with the extent of adoption of recommended drought management practices for rice.

12. Relationship of the independent variables with extent of adoption of recommended drought management practices for coconut.

13. Direct and indirect effects of independent variables on the adoption of recommended drought management practices for rice.

14. Direct and indirect effects of independent variables on the adoption of recommended drought management practices for coconut.

15. Constraints in the adoption of recommended drought management practices as perceived by the respondents.

1. Existing drought management practices followed by the respondents for rice cultivation.

Table 3. Distribution of the respondents according to the existing drought management practices followed for rice cultivation.

(n = 120)

Sl. No.	Practice	Frequency	Percentage
1.	Use of short duration varieties	114	95.00
2.	Dibbling	2	1.67
3.	Broadcasting	9	7.50
4.	Dry sowing	13	10.83
5.	Application of additional quantity of muriate of potash	8	6.66

It is clear from Table 3 that vast majority of the respondents (95 per cent) were going for the cultivation of short duration rice varieties. 10.83 per cent of the respondents were practicing dry sowing to manage the drought situation. The practices like broadcasting, application of additional quantity of muriate of potash and dibbling were followed by 7.50 per cent, 6.66 per cent and 1.67 per cent of the respondents, respectively.

Majority of the farmers were going for the cultivation of short duration rice varieties to tackle the drought situation. This is primarily because of the greater awareness of the farmers about the advantages of growing short duration varieties. Few farmers are going for dibbling, dry sowing and broadcasting which also implies that large majority of the respondents were practising transplanting with the hope of getting higher yields. This also indicates that the respondents had not considered the probability of total crop loss in the event of the occurrence of drought situation. The practice of application of additional quantity of muriate of potash is comparatively a new recommendation and, therefore, majority of the respondents were not aware of the same as reflected in their poor adoption of this practice.

2. Existing drought management practices followed by the respondents for coconut cultivation.

Table 4. Distribution of the respondents according to the existing drought management practices followed for coconut cultivation

(n = 120)

Sl.No.	Practice	Frequency	Percentage
1.	Mulching	120	100.00
2.	Interspace digging	54	45.00
3.	Husk burial	34	28.33

A study of Table 4 reveals that all the farmers (100 per cent) were practising mulching in their coconut gardens in times of drought. Nearly half of the farmers (45 per cent) were following interspace digging and 28.33 per cent of the respondents were burying the husks in the coconut garden to overcome the drought situation.

Mulching prevents loss of moisture which will otherwise be lost by means of evaporation. Mulching reduces the frequency of irrigation and thereby it serves to be an excellent moisture conservation practice. Hence this is followed by all the farmers. Only half of the respondents were aware of the benefits of the interspace digging. Hence this is not followed by all the farmers. Only 28.33 per cent of the farmers were burying the husks in their coconut garden to conserve the moisture since it is considered to be a costly affair and this is also due to the reason that majority of the farmers were not aware of this moisture conservation practice. On a comparison of the existing

drought management practices adopted by the respondents for rice and coconut, it is crystal clear that farmer respondents had given a preferential treatment to coconut disregarding rice. The reasons are not beyond comprehension. The remunerative price for coconut is the major attraction for the farmers to care for their coconut plantations.

3.A. Level of knowledge of the respondents about recommended drought management practices for rice.

Table 5. Distribution of the respondents according to the level of knowledge about recommended drought management practices for rice.

(n = 120)

Sl.No.	Knowledge level	Frequency	Percentage
1.	Low (< 1.91)	12	10.00
2.	Medium (1.91 - 3.65)	79	65.83
3.	High (> 3.65)	29	24.17

A perusal of Table 5 indicates that 65.83 per cent of the respondents were in the medium knowledge level group while 24.17 per cent and 10 per cent of the respondents were in the high and low knowledge level groups, respectively.

The medium level of knowledge might be due to the relatively more educational facilities, and due to their frequent contacts with the extension agents of the Department of Agriculture. Nearly one-fourth of the respondents fell in the high level group of knowledge. This might be

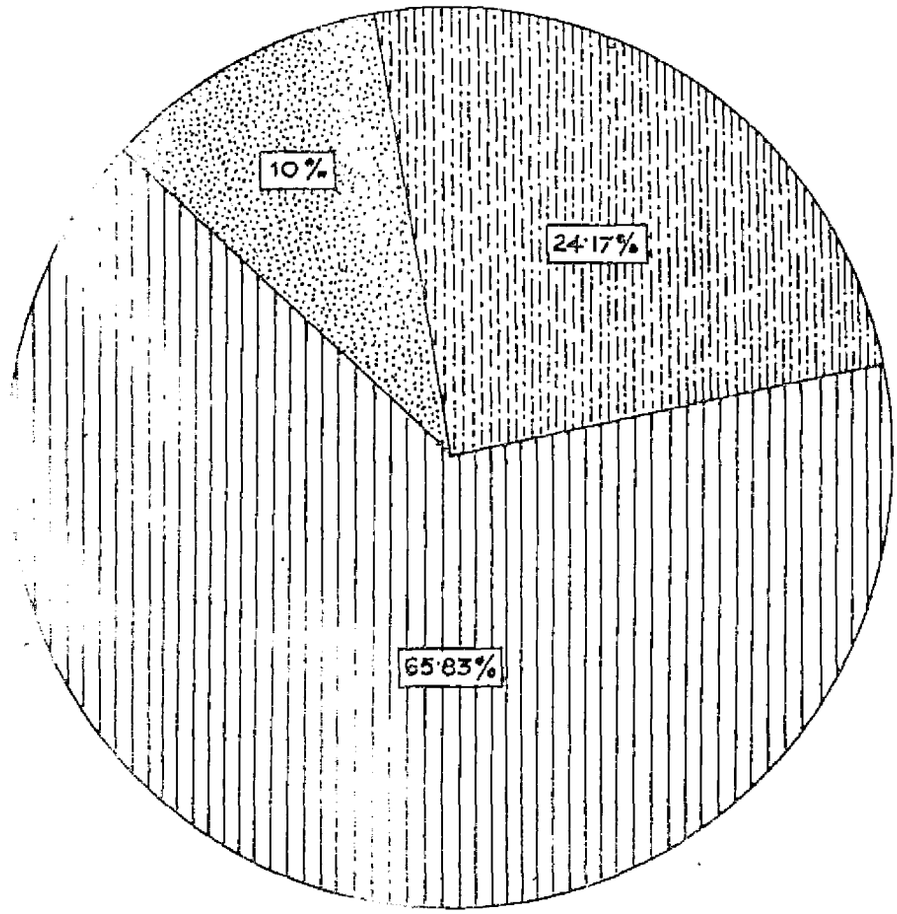

FIG. 3 LEVEL OF KNOWLEDGE ABOUT RECOMMENDED DROUGHT MANAGEMENT PRACTICES FOR RICE.

due to the increased communication facilities by mass media such as radio, television, newspapers etc.

3.B. Knowledge of the respondents about different types of recommended drought management practices for rice.

Table 6. Knowledge of the respondents about different types of recommended drought management practices for rice.

(n = 120)

Sl. No.	Practice	Correct		Incorrect	
		Frequency	Percentage	Frequency	Percentage
1.	Use of 'Suvarnamodan' or 'Annapoorna' variety	41	34.17	79	65.83
2.	Application of 34 kg each of NPK/ha	2	1.66	118	98.34
3.	Using seed at 100 kg/ha	109	90.83	11	9.17
4.	Broadcasting of seeds	118	98.34	2	1.66
5.	Cultivation of 'Triveni' and 'Annapoorna' during third crop	51	42.5	69	57.50
6.	Using Ptb-29 and Ptb-30 in upland cultivation	14	11.67	106	88.33

It is observed from Table 6 that only 34.17 per cent of the respondents were aware of the use of 'Suvarnamodan' or 'Annapoorna' in drought condition, while the rest were not knowing that. Only 1.66 per cent were knowing about the application of 34 kg each of NPK/ha during drought season, while the remaining people were completely ignorant of this

practice. A considerable percentage of the farmers (90.83 per cent) were aware of the practice of using seed at 100 kg/ha while only a few (9.17 per cent) were ignorant of this. The practices like broadcasting of paddy, cultivation of Triveni and Annapoorna during third crop, and using paddy varieties Ptb-29 and Ptb-30 in upland cultivation were known to 98.34 per cent, 42.5 per cent and 11.67 per cent, respectively.

The practices like using seed at 100 kg/ha and broadcasting of paddy were known to majority of the respondents as these practices were followed right from the very old age. Majority of the respondents were not aware of the remaining recommended practices since these practices were developed and diffused by the officials of the Agricultural Department very recently.

4.A. Level of knowledge of the respondents about recommended drought management practices for coconut.

Table 7. Distribution of the respondents according to the level of knowledge about recommended drought management practices for coconut. (n = 120)

Sl.No.	Knowledge level		Frequency	Percentage
1.	Low	($<$ 4.81)	22	18.33
2.	Medium	(4.81 - 7.55)	70	58.33
3.	High	($\geq$ 7.55)	28	23.34

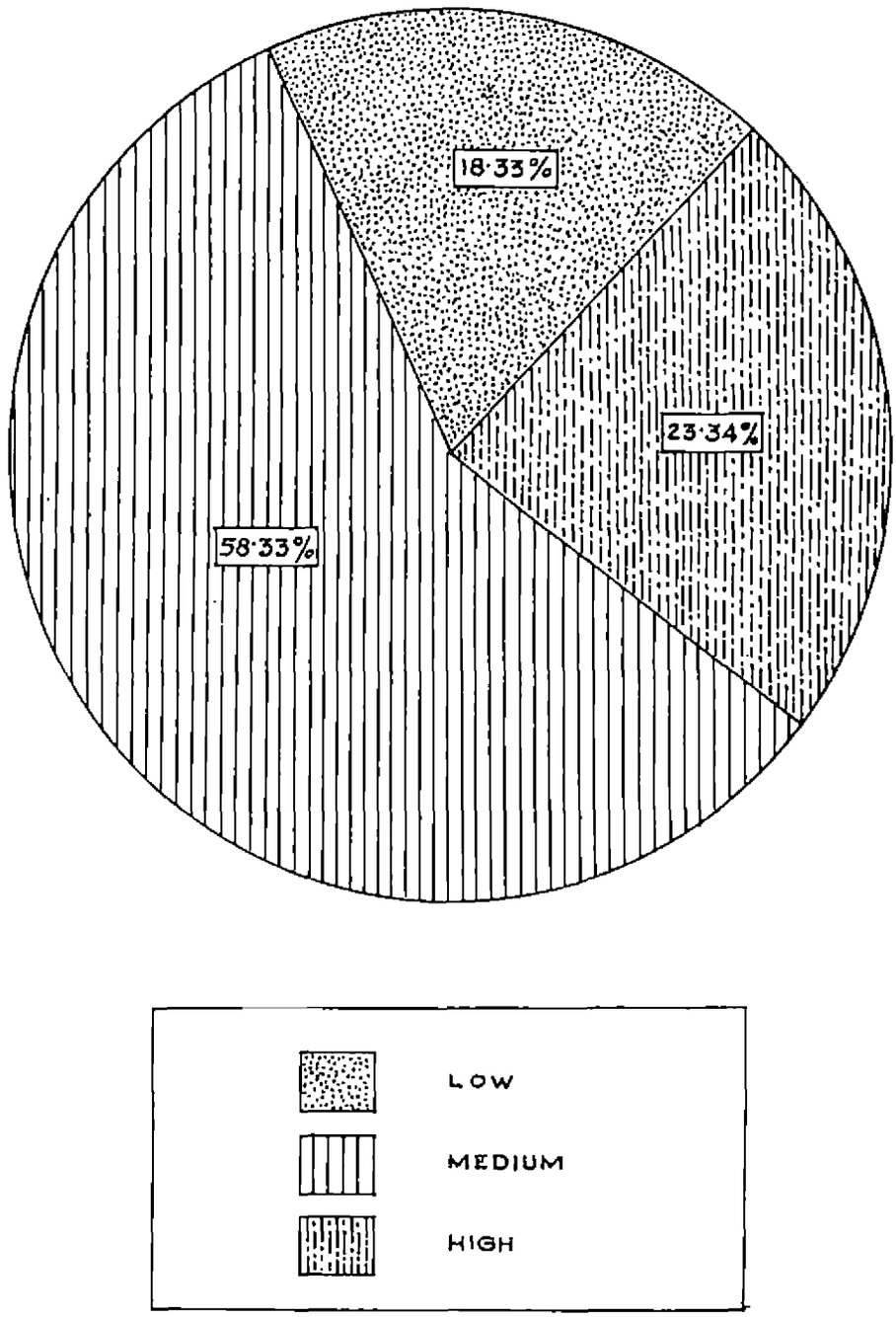

FIG. 4. LEVEL OF KNOWLEDGE ABOUT RECOMMENDED DROUGHT MANAGEMENT PRACTICES FOR COCONUT.

An observation of Table 7 indicates that 58.33 per cent of the farmers were having medium level of knowledge about the recommended drought management practices for coconut. Only 23.34 per cent and 18.33 per cent of the respondents were having high and low levels of knowledge about the drought management practices for coconut, respectively.

The reasons explained for the levels of knowledge about the recommended drought management practices for rice can be attributed here also.

4.B. Knowledge of the respondents about different types of recommended drought management practices for coconut.

Table 8. Knowledge of the respondents about different types of recommended drought management practices for coconut.

(n = 120)

Sl. No.	Practice	Correct		Incorrect	
		Frequency	Percentage	Frequency	Percentage
1.	Disturbing soil in coconut garden during summer should not be done	113	94.17	7	5.83
2.	Cutting and removal of weeds	119	99.17	1	0.83
3.	Mulching	119	99.17	1	0.83
4.	Husk burial	78	65.00	42	35.00
5.	Drip irrigation for adult palms	49	40.83	71	59.17
6.	Pitcher type irrigation with mud pots	98	81.67	22	18.33
7.	Providing shade for seedlings aged below two years	115	95.83	5	4.17

It is revealed from Table 8 that majority of the respondents (94.17 per cent) were aware of the fact that disturbing soil in coconut garden is a prohibited practice during the months of drought. Almost all the respondents were aware of the practices like cutting and removal of weeds in coconut garden, mulching in the basins of coconut palm and providing shade for seedlings aged below two years to tackle the drought situation. The practices like pitcher type irrigation with mud pots, husk burial in coconut garden and drip irrigation for adult palms were known to 81.67 per cent 65.00 per cent and 40.83 per cent of the respondents, respectively.

All the practices except drip irrigation for adult palms were known to more than 65 per cent of respondents as these practices were followed even from the very ancient period. Drip irrigation technique is of recent origin and it is being popularised only now and hence majority of the farmers were not aware of this.

5. Comparison of mean scores of the respondents on their knowledge about recommended drought management practices for rice and coconut.

The data indicating the comparison of mean scores of the respondents on their knowledge about recommended drought management practices for rice and coconut are given in Table 9.

Table 9. Comparison of mean scores of the respondents on their knowledge about recommended drought management practices for rice and coconut

(n = 120)

Sl. No.	Crop	Mean knowledge score	SD	't' value
1.	Rice	2.78	0.87	23.129*
2.	Coconut	6.18	1.37	

*Significant at 5 per cent level.

A critical examination of Table 9 shows that there was significant difference between the mean knowledge scores of the respondents with respect to their knowledge about drought management practices for rice and coconut. The mean knowledge score of coconut was higher than that of rice. The computed 't' value also shows that there was significant difference in the mean scores of knowledge about drought management practices for rice and coconut.

The main contributing factors for the high mean scores in the case of coconut are: (i) the produce fetches good remunerative price than rice. (ii) because of the perennial nature of the coconut crop the farmers are taking much care in the prophylatic and preventive measures than for rice.

Hence the hypothesis that there would be no significant difference in the farmers' knowledge about recommended

drought management practices for rice and coconut was rejected.

6.A. Level of adoption of recommended drought management practices for rice.

Table 10. Distribution of the respondents according to their level of adoption of recommended drought management practices for rice.

(n = 120)

Sl. No.	Level of Adoption	Frequency	Percentage
1.	Low (< 1.9)	3	2.50
2.	Medium (1.91 - 2.98)	61	50.83
3.	High (> 2.98)	56	46.67

The results presented in Table 10 point out that 50.83 per cent of the respondents were in the medium group of adoption of recommended drought management practices for rice, while 46.67 per cent and 2.50 per cent of the respondents were in the high and low groups respectively.

Any innovation which is to be adopted has to be necessarily the one which fits in with their convenience and economic condition. Effective extension work and the efficient communication net work remain to be the reasons for the higher percentage of respondents in the medium and high level of adoption group.

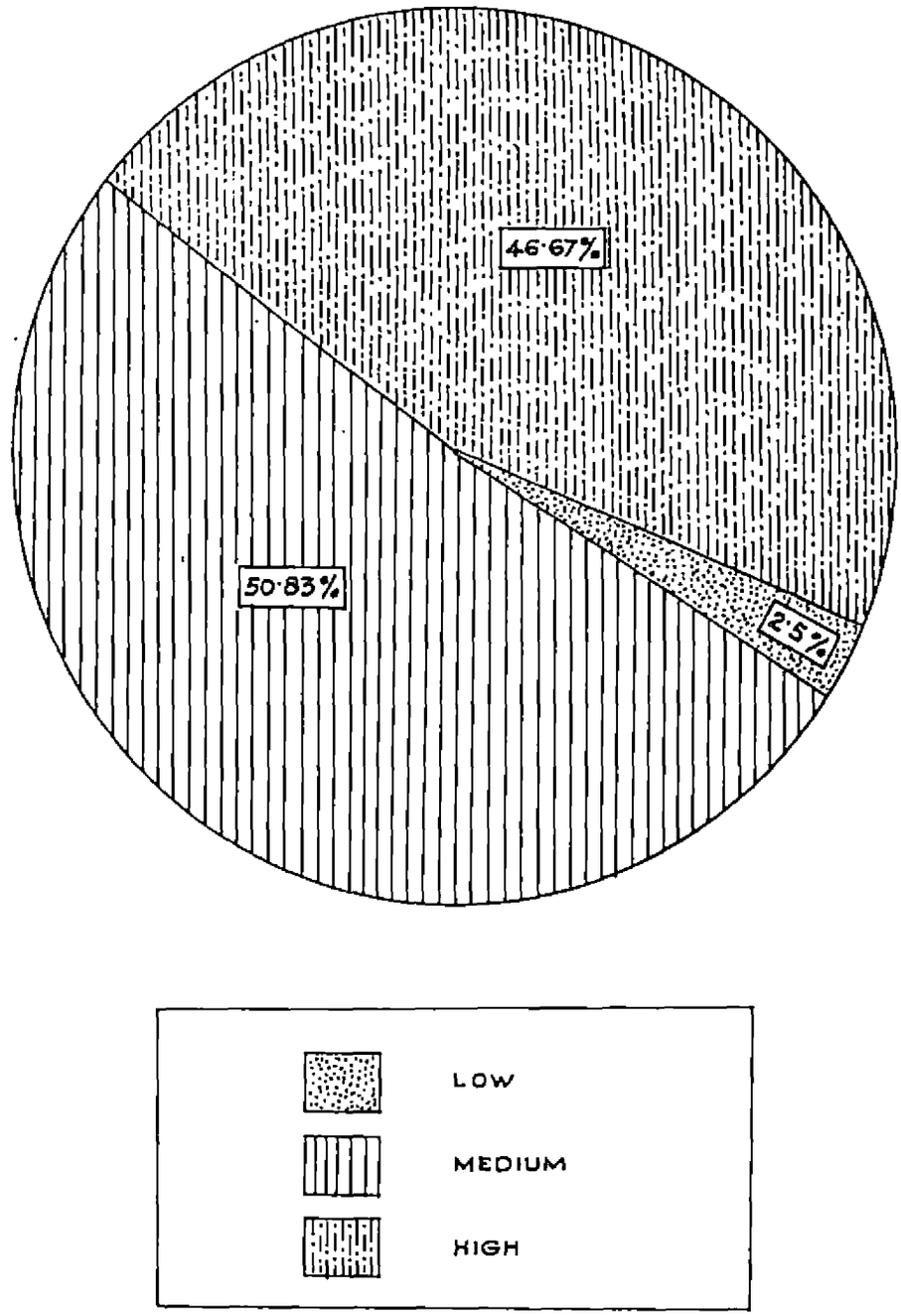

FIG. 5. LEVEL OF ADOPTION OF RECOMMENDED DROUGHT MANAGEMENT PRACTICES FOR RICE.

The pattern of results obtained here correlates well with that obtained in the case of the knowledge of the respondents about recommended drought management practices for rice indicating a near 1 : 1 relationship.

6.B. Adoption of different types of recommended drought management practices for rice by the respondents.

Table 11. Extent of adoption of recommended drought management practices for rice by the respondents

(n = 120)

Sl. No.	Practice	Adopters		Non-Adopters	
		Frequency	Percentage	Frequency	Percentage
1.	Use of Suvarnamodan or Annapoorna varieties	2	1.67	118	98.33
2.	Application of 34kg each of NPK/ha	-	-	120	100.00
3.	Using seed at 100 kg/ha	110	91.66	10	8.34
4.	Cultivation of Triveni or Annapoorna during third crop	56	46.66	64	53.34
5.	Using Ptb-29 and Ptb-30 in upland cultivation	2	1.67	118	98.33
6.	Broadcasting of seeds	92	76.67	28	23.33

It could be inferred from Table 11 that 91.66 per cent, 76.67 per cent and 46.66 per cent were adopting the practices like using seed at 100 kg/ha, broadcasting of paddy seeds and cultivation of Triveni or Annapoorna during third crop season respectively. Only 1.67 per cent of the respondents were

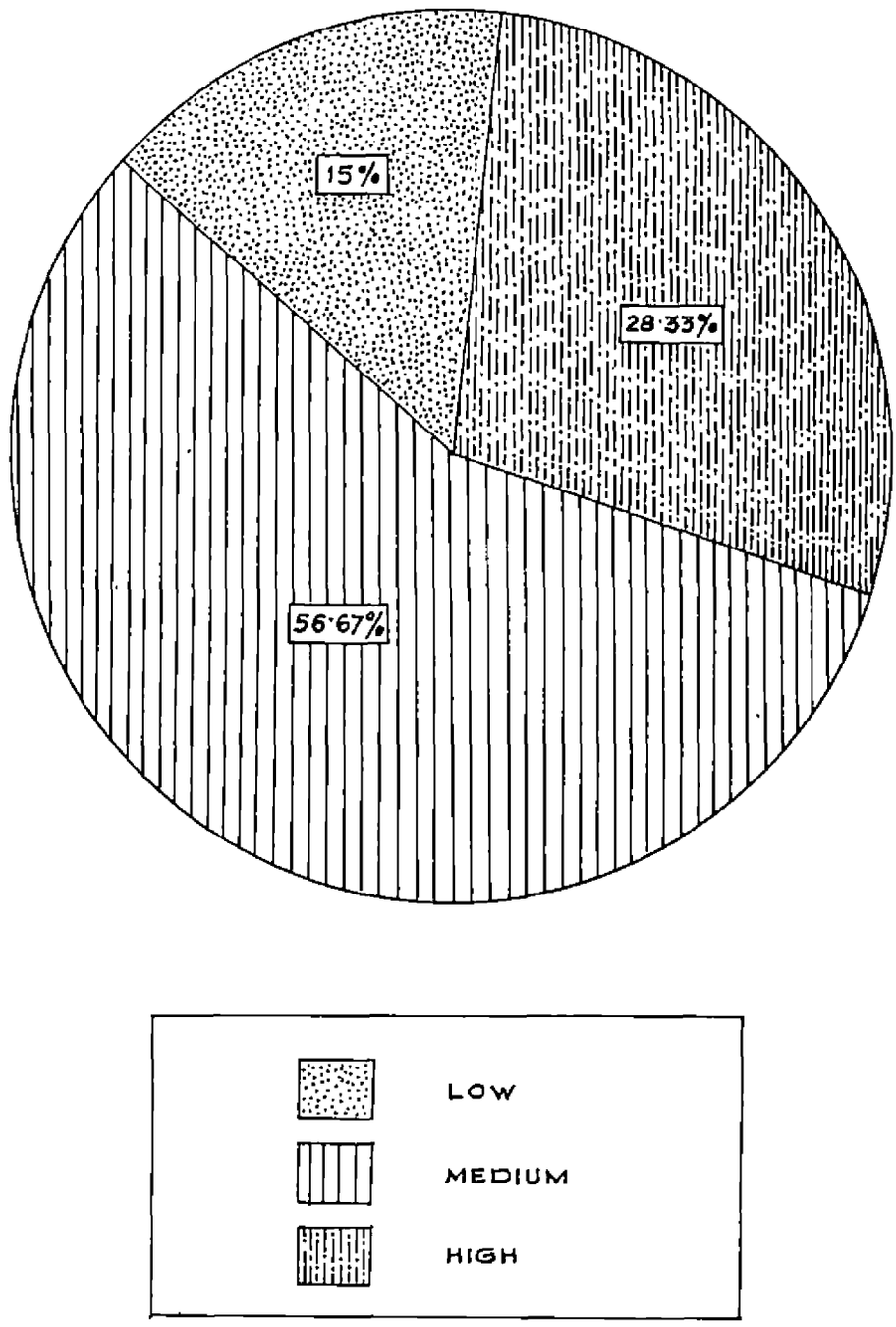

FIG. 6. LEVEL OF ADOPTION OF RECOMMENDED DROUGHT MANAGEMENT PRACTICES FOR COCONUT.

adopting the practices like use of Suvarnamodan or Annapoorna in drought condition and using Ptb-29 and Ptb-30 in upland cultivation to tackle the drought situation. None of the respondents had practised application of 34kg each of NPK/ha.

The practices like use of Suvarnamodan or Annapoorna in drought condition, application of 34 kg each of NPK/ha and using Ptb-29 and Ptb-30 in upland cultivation were not adopted by large majority of the respondents because such practices are not known to the farmers. The remaining practices were adopted by more number of respondents as they are aware of the techniques and benefits of these practices.

7.A. Level of adoption of recommended drought management practices for coconut by the respondents.

Table 12. Distribution of the respondents according to their level of adoption of recommended drought management practices for coconut. (n = 120)

Sl. No.	Level of adoption	Frequency	Percentage
1.	Low ($\leq$ 4.45)	18	15.00
2.	Medium (4.45 - 5.87)	68	56.67
3.	High ($\geq$ 5.87)	34	28.33

A glance at Table 12 indicated that 56.67 per cent of the farmers were in the medium group with regard to the

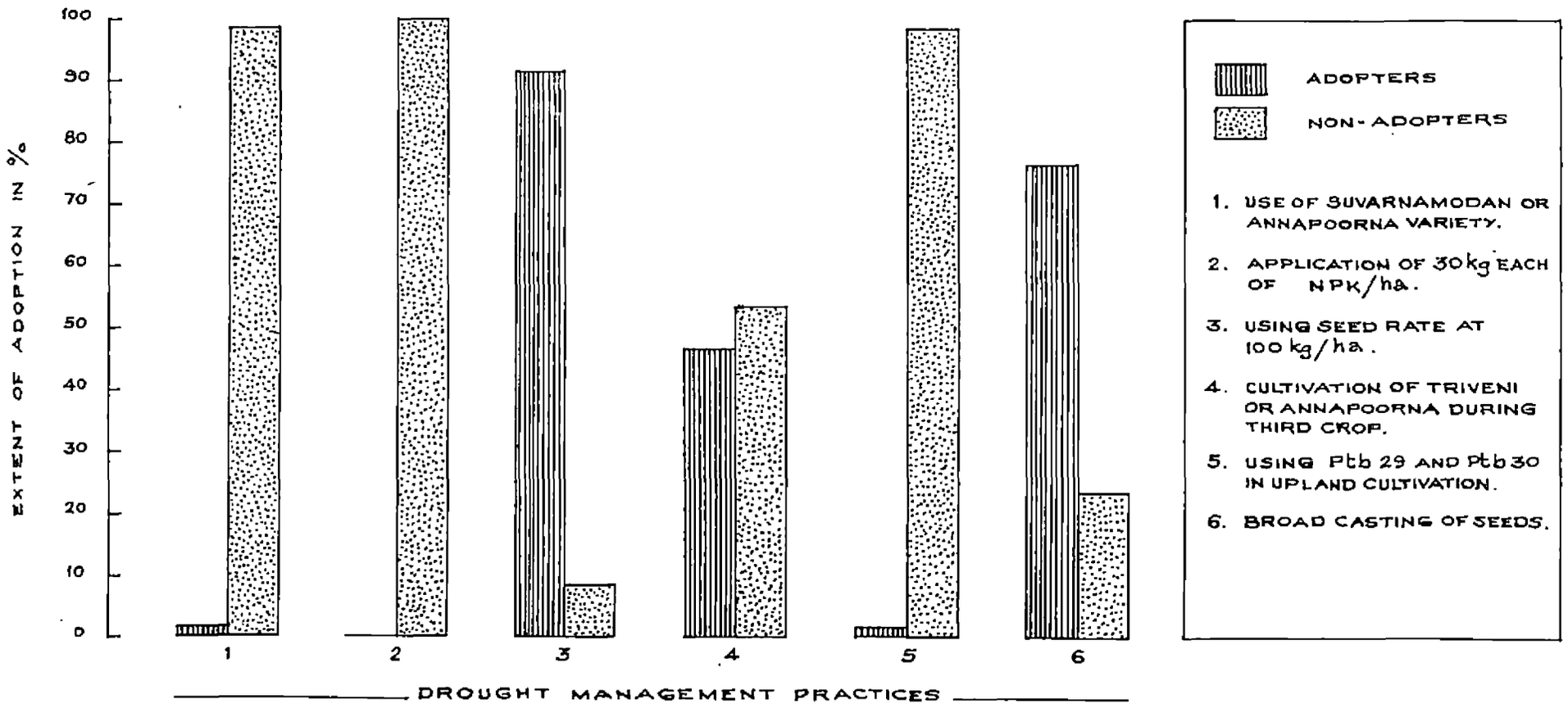

FIG. 7. EXTENT OF ADOPTION OF RECOMMENDED DROUGHT MANAGEMENT PRACTICES FOR RICE.

adoption of the recommended drought management practices for coconut. 28.33 per cent and 15.00 per cent of the respondents were in the high and low groups, respectively.

Here also there was similarity in the levels of knowledge and adoption by the respondents with regard to drought management practices for coconut signifying the presence of basic relationship between the two important components of human behaviour viz. knowledge and adoption.

7.B. Adoption of different types of recommended drought management practices for coconut by the respondents.

Table 13. Extent of adoption of recommended drought management practices for coconut by the respondents.

(n = 120)

Sl. No.	Practice	Adopters		Non-adopters	
		Frequency	Percentage	Frequency	Percentage
1.	Disturbing soil in coconut garden during summer should not be done	113	94.16	7	5.84
2.	Cutting and removal of weeds	118	98.33	2	1.67
3.	Mulching	119	99.16	1	0.84
4.	Husk burial	30	25.00	90	75.00
5.	Drip irrigation for adult palms	2	1.67	118	98.33
6.	Pitcher type irrigation with mudpots	114	95.00	6	5.00
7.	Providing shade for coconut seedlings aged below two years	114	95.00	6	5.00

It is noted from Table 13 that the practices like mulching in the basins of coconut palms, cutting and removal

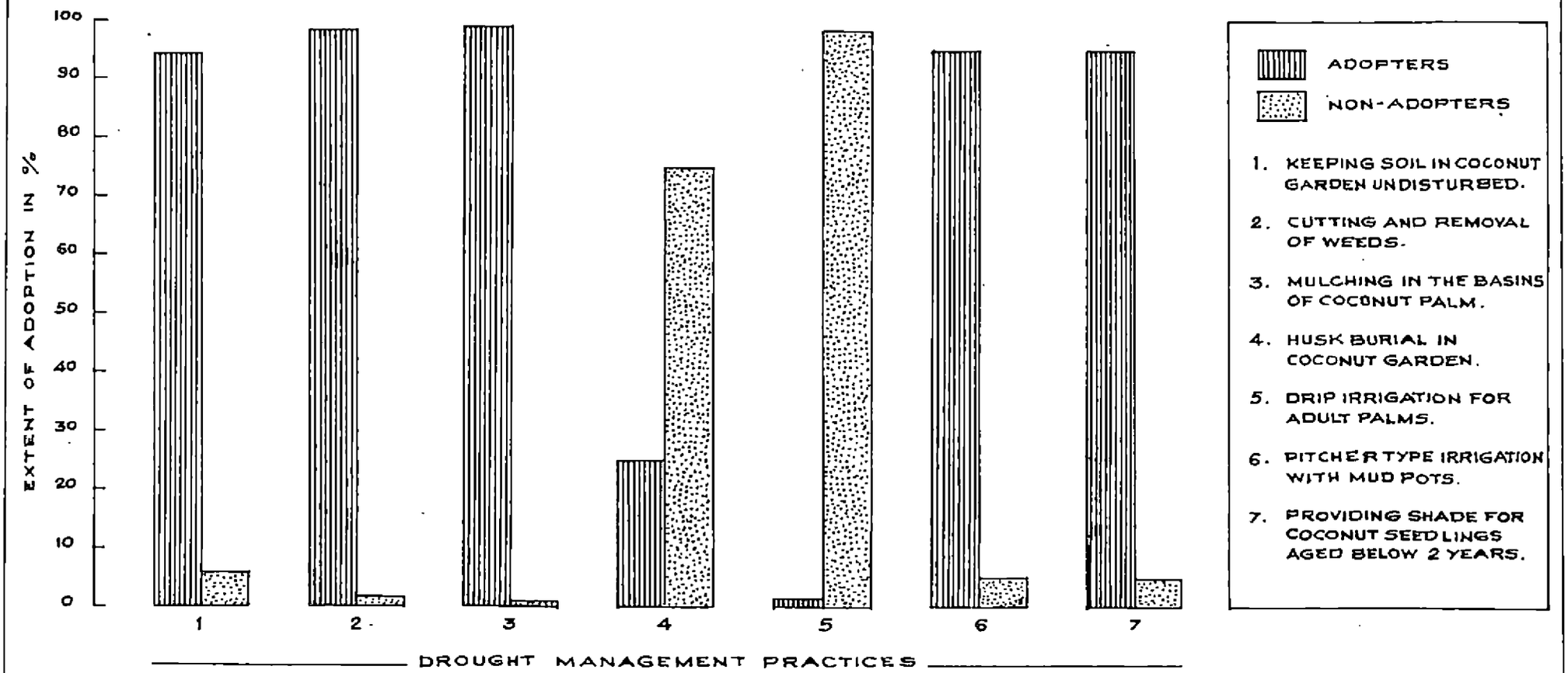

FIG. 8. EXTENT OF ADOPTION OF RECOMMENDED DROUGHT MANAGEMENT PRACTICES FOR COCONUT.

of weeds, pitcher type irrigation with mudpots, providing shade for coconut seedlings aged below two years and keeping soil in coconut garden undisturbed were being adopted by over 90 per cent of the respondents. One-fourth of the respondents were practicing husk burial in coconut gardens. Drip irrigation for adult palms was practised by exceptionally few respondents (1.67 per cent).

The practices other than husk burial and drip irrigation are being practised from very early periods. The low cost involved and the requirement of only less technical skills serve to be the reasons for the higher adoption of these practices. The practices like husk burial and drip irrigation need more technical skills and one has to invest more money for such operations. The poor awareness of the respondents about these practices also contributes much for their poor adoption.

8. Comparison of mean scores of the respondents on their adoption of recommended drought management practices for rice and coconut.

The data representing the mean scores of the respondents on their adoption of recommended drought management practices for rice and coconut are given in Table 14.

Table 14. Comparison of mean scores of the respondents on their adoption of recommended drought management practices for rice and coconut

(n = 120)

Sl. No.	Crop	Mean adoption score	SD	't' value
1.	Rice	2.44	0.54	33.49*
2.	Coconut	5.16	0.71	

*Significant at 5 per cent level.

The results presented in Table 14 shows that there was significant difference between the mean adoption scores of the respondents with respect to their adoption of drought management practices for rice and coconut. The mean adoption score for coconut was higher than that of rice. The computed 't' value also shows that there was significant difference in the mean scores on the adoption of drought management practices for rice and coconut.

Since coconut is a highly remunerative crop enterprise, farmers give much importance to the crop in adopting recommended drought management practices. The farmers give maximum attention to this crop because its cost : benefit ratio is higher than that of rice.

In view of the above, the hypothesis that there would be no significant difference in the farmers adoption of recommended drought management practices for rice and coconut was rejected.

9. Level of awareness of the respondents about the drought-proneness of crops

Table 15. Distribution of the respondents according to the awareness of the drought-proneness of crops.

(n = 120)

Sl. No.	Level of awareness	Frequency	Percentage
1.	Low (< 3.52)	14	11.67
2.	Medium (3.52 - 5.14)	98	81.66
3.	High (≥ 5.14)	8	6.67

Mean score - 4.51
S.D. - 0.63

It could be seen from Table 15 that 81.66 per cent of the respondents belonged to the medium group with regard to their awareness of the drought-proneness of crops while 11.67 per cent and 6.67 per cent of the respondents were in the low and high groups, respectively.

Frequent contacts with the extension personnel and regular informations about the drought-proneness through mass media such as television, radio and newspaper made the farmers to be aware of the drought-proneness of crops.

It is quite obvious that in a state like Kerala where over 70 per cent of the people are literate, the farmers would be in the know of things. With the recurrent droughts and the attendant publicity given by the Government through the multiplicity of media, the farmers were only too

aware of the drought-proneness of crops as reflected by the high mean awareness score of 4.51 obtained in this regard.

10. Level of knowledge of the respondents about the parameters of drought.

Table 16. Distribution of the respondents according to their knowledge about the parameters of drought

(n = 120)

Sl. No.	Level of knowledge	Frequency	Percentage
1.	Low (< 3.51)	28	23.33
2.	Medium (3.51 - 5.87)	50	41.67
3.	High (> 5.87)	42	35.00

Mean score - 4.69
S.D. - 1.18

Table 16 presents that 41.67 per cent of the respondents were in the medium group and 35.00 and 23.33 per cent of the respondents congregated in the high and low groups, respectively.

Higher literacy percentage, increased knowledge on the cultivation aspects, a good farming experience of the majority of the farmers and effective extension education efforts by the Agricultural Department personnel were the reasons for the increased level of knowledge about the parameters of drought. It is a happy augury that the farmers of Kerala were aware not only of drought-proneness

of crops but also about the scientific parameters of it as indicated by the high mean score of 4.69 obtained in this case.

11. Relationship of independent variables withthe extent of adoption of recommended drought management practices for rice and coconut.

Table 17 gives the inter-correlation matrix which represents the inter-relationships among the variables. The independent variables and their correlation with the extent of adoption of recommended drought management practices for rice and coconut are given in Tables 18 and 19, respectively.

Age

Age showed positive but non-significant relationship with the adoption of drought management practices for rice.

This finding is supported by Apparao (1971), Somasundaram (1976), and Manivannan (1980).

Whether young or old, those who are exposed to scientific crop cultivation through various extension activities and who are convinced of its quality would adopt the practice. This could probably be the reason for the phenomenon observed in this context.

Table 17. Inter-correlation Matrix

(n = 120)

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}
X_1	1.000	-.333**	.0322	.0327	-.0501	.0797	-.1519	-.1502	.1930*	.0131	-.1307	.0592	.0063
X_2		1.000	.1929*	.2157*	.0180	.0800	.1473	.0667	.1035	-.2347	.1085	.1643	.0063
X_3			1.000	.7110**	.0860	.0447	.0017	.3469**	.3951**	-.0125	.0908	.3103**	.4082**
X_4				1.000	.2680**	.0073	.0743	.2616**	.3462**	-.2813**	.0630	.0840	.3905**
X_5					1.000	.0386	.2958**	.2367*	-.0005	-.2574**	.3889**	-.0055	.1395
X_6						1.000	.1778	-.0043	.0217	-.1279	.0753	-.1172	.0370
X_7							1.000	.0941	-.0606	-.1053	.2374*	.0084	-.0313
X_8								1.000	.2369*	-.1404	.0622	.1217	.1797
X_9									1.000	-.0402	-.1193	.2708**	.2965**
X_{10}										1.000	.0648	.1224	-.1427
X_{11}											1.000	.0433	-.1011
X_{12}												1.000	.2729**
X_{13}												.2729**	1.000

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

X_1 Age.
X_2 Education.
X_3 Size of holding.
X_4 Annual income.
X_5 Risk orientation.
X_6 Economic motivation.
X_7 Scientific orientation
X_8 Knowledge about recommended drought management practices for rice.
X_9 Knowledge about recommended drought management practices for coconut.
X_{10} Awareness of farmers about drought proneness of crops.
X_{11} Knowledge of farmers about parameters of drought.
X_{12} Extent of adoption of recommended drought management practices for rice.
X_{13} Extent of adoption of recommended drought management practices for coconut.

Table 18. Correlation between adoption of recommended drought management practices for rice cultivation by the respondents and their socio-economic and psychological characteristics

(n = 120)

Sl. No.	Socio-economic and psychological characteristics	Correlation co-efficients
1.	Age	0.0592 NS
2.	Education	0.1643 NS
3.	Size of holding	0.3103 **
4.	Annual income	0.0840 NS
5.	Risk orientation	-0.0055 NS
6.	Economic motivation	-0.1172 NS
7.	Scientific orientation	0.0084 NS
8.	Knowledge about recommended drought management practices for rice	0.1217 NS
9.	Knowledge about recommended drought management practices for coconut	0.2708 **
10.	Awareness about drought proneness of crops	0.1224 NS
11.	Knowledge about parameters of drought	0.0433 NS
12.	Extent of adoption of recommended drought management practices for coconut	0.2729 **

NS - Non-significant

* - Significant at 5 per cent level.

** - Significant at 1 per cent level.

In the light of the above, the hypothesis set up for the study that, there would be no significant relationship between age of farmers and their adoption of recommended drought management practices for rice was accepted.

Education

Table 18 clearly indicated the prevalence of positive but non-significant relationship between educational level of the farmer-respondents and their extent of adoption of recommended drought management practices for rice.

This is in line with the findings of Nair (1969), Bhaskaran (1978) and Ravi (1979).

On an examination of the distribution of the respondents according to their level of education it could be seen that a large chunk of the respondents had education below secondary level indicating lack of much variability among the respondents in this regard. When such is the case, it is only obvious that there would not be any significant relationship between the level of education and adoption behaviour of the farmers.

Hence, the hypothesis that there would be no significant relationship between education of farmers and their adoption of recommended drought management practices for rice was accepted.

Size of holding

The data presented in Table 18 supported the proposition that there would be positive and significant relationship between size of holding and adoption.

This is in conformity with the findings of Acharya (1970), Oliver (1971) and Pillai (1978).

As the farm size increases, the farmer will have more agricultural needs, in respect of physical inputs particularly than holders of small farmers. Hence farmers with large land holdings are likely to adopt better management practices to increase their income and standard of living.

In view of the above the hypothesis that there would be no significant relationship between size of holding of farmers and their adoption of recommended drought management practices for rice was rejected.

Annual Income

It could be seen from Table 18 that annual income showed positive but non-significant relationship with the adoption of drought management practices for rice.

This finding does not conform to the findings of Ramamoorthy (1973) and Pillai (1978).

To the farmers of Kerala, rice cultivation has turned out to be a non-remunerative crop production enterprise in

the recent past. This is reflected in the total disregard that they show towards rice cultivation. Even if the farmers are well-off they do not bother to spare their financial resources for improving rice production. This trend could probably be attributed to the results obtained.

Hence the hypothesis that there would be no significant relationship between annual income of farmers and their adoption of recommended drought management practices for rice was accepted.

Risk-orientation

Risk-orientation exhibited negative but non-significant correlation with the extent of adoption of recommended drought management practices for rice.

This is contradictory to the findings reported by Tripathy (1977), Rajendran (1978) and Pillai (1983).

Past studies have unequivocally pointed out to the prevalence of risk-taking tendency among the farmers when the chances of success are fairly high. There are many studies conducted among farmers growing commercial crops to prove this point. Rice, considered as a non-paying crop enterprise, receives only a step-motherly treatment from the farmers of Kerala. Even if the farmers are high in the echelons of risk-orientation, one cannot expect them to exhibit the risk-orientation in an enterprise like rice

cultivation and hence the above result of non-significant relationship between risk-orientation and adoption behaviour of farmers.

In the light of the above discussion, the hypothesis formulated in the study that there would be no significant relationship between risk-orientation and adoption of recommended drought management practices for rice was accepted.

Economic Motivation

Economic motivation also had negative but non-significant relationship with the adoption of recommended drought management practices for rice.

This is not in support of the findings of Nair (1969) and Rajendran (1978).

Rice being less profitable crop enterprise, whatever may be the economic position of the farmers they are reluctant to pay attention to the drought management practices due to the non-remunerative nature of the crop.

Therefore, the hypothesis that there would be no significant relationship between economic motivation of farmers and their adoption of recommended drought management practices for rice was accepted.

Scientific orientation

Scientific orientation was found to possess positive

but non-significant relationship with the adoption of recommended drought management practices for rice.

This is in conformity with the findings of Reddy, and Kivlin (1968) and Philip (1984).

Even if the farmers are having good knowledge about the scientific management practices of rice, they are unwilling to adopt the practices, since it is a non-paying crop enterprise. Hence the above result of positive but non-significant relationship between scientific orientation and adoption behaviour of farmers in respect of rice.

In view of the above, the hypothesis that there would be no significant relationship between scientific orientation of farmers and their adoption of recommended drought management practices for rice was accepted.

Knowledge about recommended drought management practices for rice.

Knowledge about drought management practices for rice was found to possess positive but non-significant relationship with the extent of adoption.

This finding is not in conformity with that reported by Deepali (1979).

The non-significant relationship between farmers knowledge about recommended drought management practices for

rice and their adoption of these practices could well be attributed to the basic difference between these two variables. While knowledge is a cognitive component of human behaviour, adoption represents the conative aspect of human behaviour as opined by Fishbein (1973).

In view of the above discussion the hypothesis that there would be no significant relationship between knowledge of farmers about recommended drought management practices of rice and their adoption of recommended drought management practices for rice was accepted.

Knowledge about recommended drought management practices for coconut

Positive and significant correlation was observed between knowledge about recommended drought management practices for coconut and extent of adoption of drought management practices for rice as revealed in Table 18.

This is in conformity with the findings of Deepali (1979), Pillai (1983) and Rajapandi (1983).

When a farmer has a sound knowledge about one aspect of a crop enterprise, he would seek to gather more information on other crop enterprises also. From this assumption, it could be deduced that the farmer with up dated knowledge on the drought management practices for coconut would strive to up date his knowledge on the drought management practices for rice crop also.

In view of the above explanation, the hypothesis that there would be no significant relationship between knowledge of farmers about recommended drought management practices of coconut and their adoption of recommended drought management practices for rice was rejected.

Awareness of the respondents about drought proneness of crops

There was positive but non-significant correlation between the awareness of the respondents about drought proneness of crops and the extent of their adoption of recommended drought management practices for rice.

The discrepency between cognitive and conative components of human behaviour as propounded by Fishbein (1973) could be attributed as the reason for this phenomenon.

In view of the above, the hypothesis that there would be no significant relationship between awareness of the farmers about the drought proneness of crops and their adoption of recommended drought management practices for rice was accepted.

Knowledge about the parameters of drought

This variable was also found to have positive but non-significant relationship with the adoption of drought management practice for rice by the respondents.

This finding does not conform to the finding of Deepali (1979).

The same reason attributed to in the case of awareness about drought proneness of crops is relevant here also.

In the light of the above, the hypothesis that there would be no significant relationship between knowledge of farmers about parameters of drought and their adoption of recommended drought management practices for rice was accepted.

Extent of adoption of recommended drought management practices for coconut

This variable indicated positive and significant relationship with the extent of adoption of recommended drought management practices for rice.

When a farmer adopts cultural practices for one crop to tackle the drought situation, he normally adopts relevant practices for other crops also. Therefore, it is obvious that the farmers adoption behaviour in respect of rice and coconut would be correlated positively.

Therefore, the hypothesis that there would be no significant relationship between the farmers extent of adoption of recommended drought management practices for

coconut and their adoption of recommended drought management practices for rice was rejected.

12. Relationship of the independent variables with the extent of adoption of recommended drought management practices for coconut.

The relationship between the independent variables and the extent of adoption of drought management practices for coconut was worked out by computing the co-efficients of correlation. The results obtained are furnished in Table 19.

Table 19. Correlation between adoption of recommended drought management practices for coconut cultivation by the respondents and their socio-economic and psychological characteristics (n = 120)

Sl. No.	Socio-economic and Psychological characteristics	Correlation coefficients
1.	Age	0.0063 NS
2.	Education	0.0067 NS
3.	Size of holding	0.4082 **
4.	Annual Income	0.3905 **
5.	Risk Orientation	0.1395 NS
6.	Economic motivation	0.0370 NS
7.	Scientific Orientation	-0.0313 NS
8.	Knowledge about recommended drought management practices for rice	0.1797 NS
9.	Knowledge about recommended drought management practices for coconut	0.2965 **
10.	Awareness about drought proneness of crops	-0.1427 NS
11.	Knowledge about parameters of drought	-0.1011 NS
12.	Extent of adoption of recommended drought management practices of rice	0.2729 **

NS - Non-significant.
* - Significant at 5 per cent level.
** - Significant at 1 per cent level.

Age

Age exhibited a positive but non-significant relationship with the extent of adoption of recommended drought management practices for coconut, indicating that irrespective of age, the farmers, if they are convinced of the benefits of improved practices, they would adopt these practices.

This is in conformity with the findings of Apparao (1971), Manivannan (1980) and Somasundaram (1976).

Hence, the hypothesis that there would be no significant relationship between age of farmers and their adoption of recommended drought management practices for coconut was accepted.

Education

Educational status of the respondents showed a positive but non-significant relationship with their extent of adoption of recommended drought management practices for coconut.

This finding is supported by Bhaskaran (1978) and Ravi (1979).

On a perusal of the level of education of the respondents it could be seen that a large majority of the respondents were in the below secondary level group. Since there was not much variability in the level of education amongst the respondents, there was probably not much variability in their extent of

adoption too. This would have resulted in the trend of non-significant relationship between these two variables as observed in the present study.

In view of the above, the hypothesis that there would be no significant relationship between education of farmers and their adoption of recommended drought management practices for coconut was accepted.

Size of holding

Positive and significant relationship was prevalent between the size of the holdings of the respondents and their extent of adoption of recommended drought management practices for coconut.

This is in line with the findings of Oliver (1971) and Pillai (1978).

Farmers with large land holdings would greatly feel the adverse effects of drought on coconut than the small farm operations since in large orchards, coconut farming is carried out as a commercial enterprise. Hence it is obvious to expect that large farm operations would exhibit higher adoption of drought management practices than their counterparts.

In view of the above discussion there would be no significant relationship between size of holding of farmers and their adoption of recommended drought management practices for coconut was rejected.

reason explained in the case of the positive relationship between risk orientation of farmers and their adoption of recommended drought management practices for coconut would be relevant in this case also.

Yet, in the absence of significant correlation value, the hypothesis that there would be no significant relationship between economic motivation of farmers and their adoption of recommended drought management practices for coconut was accepted.

Scientific Orientation

Scientific orientation was found to possess negative and non-significant relationship with the extent of adoption of recommended drought management practices for coconut.

This is in conformity with the findings of Philip (1984).

Even without the knowledge about the sientific management practices of coconut, they are able to get the required yield, since it is a perennial crop. Hence the above result of negative and non-significant relationship between scientific orientation and adoption behaviour of farmers in respect of coconut.

In view of the above, the hypothesis that there would be no significant relationship between scientific orientation

Annual Income

The data supported the proposition that there would be positive and significant relationship between annual income of the respondents and their extent of adoption of recommended drought management practices for coconut.

This is in line with the findings of Ramamoorthy(1973) and Pillai (1978).

The farmers of Kerala considered the cultivation of coconut as highly remunerative profitable crop enterprise. When such is the case, they would not hesitate a while to spend their financial resources in protecting their coconut palm from the ill-effects of continued drought. This would be probably the reason for the phenomenon of positive and significant relationship between annual income and adoption of recommended drought management practices for coconut.

In the light of the above, the hypothesis that there would be no significant relationship between annual income of farmers and their adoption of recommended drought management practices for coconut was rejected.

Risk Orientation

Risk orientation was found to have positive but non-significant relationship with extent of adoption of recommended drought management practices for coconut.

This finding is not in line with the finding reported by Tripathy (1977) and Rajendran (1978).

The reason for the positive relationship between farmer's risk orientation and their adoption of recommended drought management practices for coconut is not beyond comprehension. By and large, the coconut growers face no risk at all since the crop is a source of regular and substantial income. But the face of this was changed with recurrent drought in Kerala. When the situation is so challenging it is only natural that farmers would be more risk prone than ever before. However, in the absence of any significant relationship between these two variables, the hypothesis that there would be no significant relationship between risk orientation of farmers and their adoption of recommended drought management practices for coconut was accepted.

Economic Motivation

This was also found to possess positive and non-significant relationship with the extent of adoption of recommended drought management practices for coconut.

This result is not in conformity with the finding of Nair (1969) and Rajendran (1978).

Since there are close links between these two variables namely, economic motivation and risk orientation, the

reason explained in the case of the positive relationship between risk orientation of farmers and their adoption of recommended drought management practices for coconut would be relevant in this case also.

Yet, in the absence of significant correlation value, the hypothesis that there would be no significant relationship between economic motivation of farmers and their adoption of recommended drought management practices for coconut was accepted.

Scientific Orientation

Scientific orientation was found to possess negative and non-significant relationship with the extent of adoption of recommended drought management practices for coconut.

This is in conformity with the findings of Philip (1984).

Even without the knowledge about the sientific management practices of coconut, they are able to get the required yield, since it is a perennial crop. Hence the above result of negative and non-significant relationship between scientific orientation and adoption behaviour of farmers in respect of coconut.

In view of the above, the hypothesis that there would be no significant relationship between scientific orientation

of farmers and their adoption of recommended drought management practices for coconut was accepted.

Knowledge about recommended drought management practices for rice

This indicated positive and non-significant relationship with the extent of adoption of recommended drought management practices for coconut.

This is not in line with the finding of Deepali (1979). The relationship was not statistically significant, the hypothesis that there would be no significant relationship between knowledge of farmers about recommended drought management practices of rice and their adoption of recommended drought management practices for coconut was accepted.

Knowledge about recommended drought management practices for coconut

Positive and significant relationship was found between the knowledge of the respondents about recommended drought management practices for coconut and their extent of adoption of coconut.

This is supported by Deepali (1979) and Rajapandi(1983).

When the knowledge on the recommended drought management practices of coconut increases, the farmers naturally try to adopt the recommended drought management practices of the same

crop, since there is the cause-effect relationship between the cognitive and conative components of human behaviour.

In view of the above the hypothesis that, there would be no significant relationship between knowledge about recommended drought management practices for coconut and their adoption of recommended drought management practices for coconut was rejected.

Awareness of the farmers about drought proneness of crops

This showed negative and non-significant relationship with the extent of adoption of recommended drought management practices for coconut.

On an analysis of the distribution of respondents on their knowledge about drought proneness of crops, it is found that, the farmers were having less knowledge about the drought proneness of crops. This might be the reason for the non-significant relationship obtained in this context.

Therefore, the hypothesis that there would be no significant relationship between awareness of the farmers about drought proneness of crops and their adoption of recommended drought management practices for coconut was accepted.

Knowledge about parameters of drought

This was also found to have negative and non-significant

relationship with the extent of adoption of recommended drought management practices for coconut.

This is not in the line of finding of Deepali (1979).

The same reason attributed in the case of awareness about drought proneness of crops is applicable in this case also.

In the light of the above, the hypothesis that there would be no significant relationship between knowledge about parameters of drought and their adoption of recommended drought management practices for coconut was accepted.

Extent of adoption of recommended drought management practices for rice

It could be observed from the table that extent of adoption of recommended drought management practices for rice showed positive and significant relationship with the extent of adoption of recommended drought management practices for coconut.

This finding substantiates the fact that farmers were not biased in the adoption of drought management practices for the two crops viz. Rice and coconut. When they were adopting drought management practices for rice they were also adopting these practices for coconut.

In view of the above, the hypothesis that there would

be no significant relationship of recommended drought management practices for rice and their adoption of recommended drought management practices for coconut was rejected.

13. Path coefficients of selected independent variables on the extent of adoption of recommended drought management practices for rice.

Path analysis showing the direct and indirect effects of the selected variables viz. size of holding, knowledge about recommended drought management practices for ~~rice~~ coconut and extent of adoption of recommended drought management for coconut are given in Table 20. This path analysis helped to analyse the factors which directly or indirectly influenced the adoption.

Table 20. Direct and indirect effects of component factors on the extent of adoption of recommended drought management practices for rice. (n = 120)

	X_3	X_9	X_{13}	Total
X_3	0.<u>190</u>	0.060	0.061	0.311
X_9	0.075	0.<u>151</u>	0.045	0.271
X_{13}	0.078	0.045	0.<u>150</u>	0.273

Note: The underlined figures show the direct effects.

X_3 - Size of holding.

X_9 - Knowledge about recommended drought management practices for coconut.

X_{13} - Extent of adoption of recommended drought management practices for coconut.

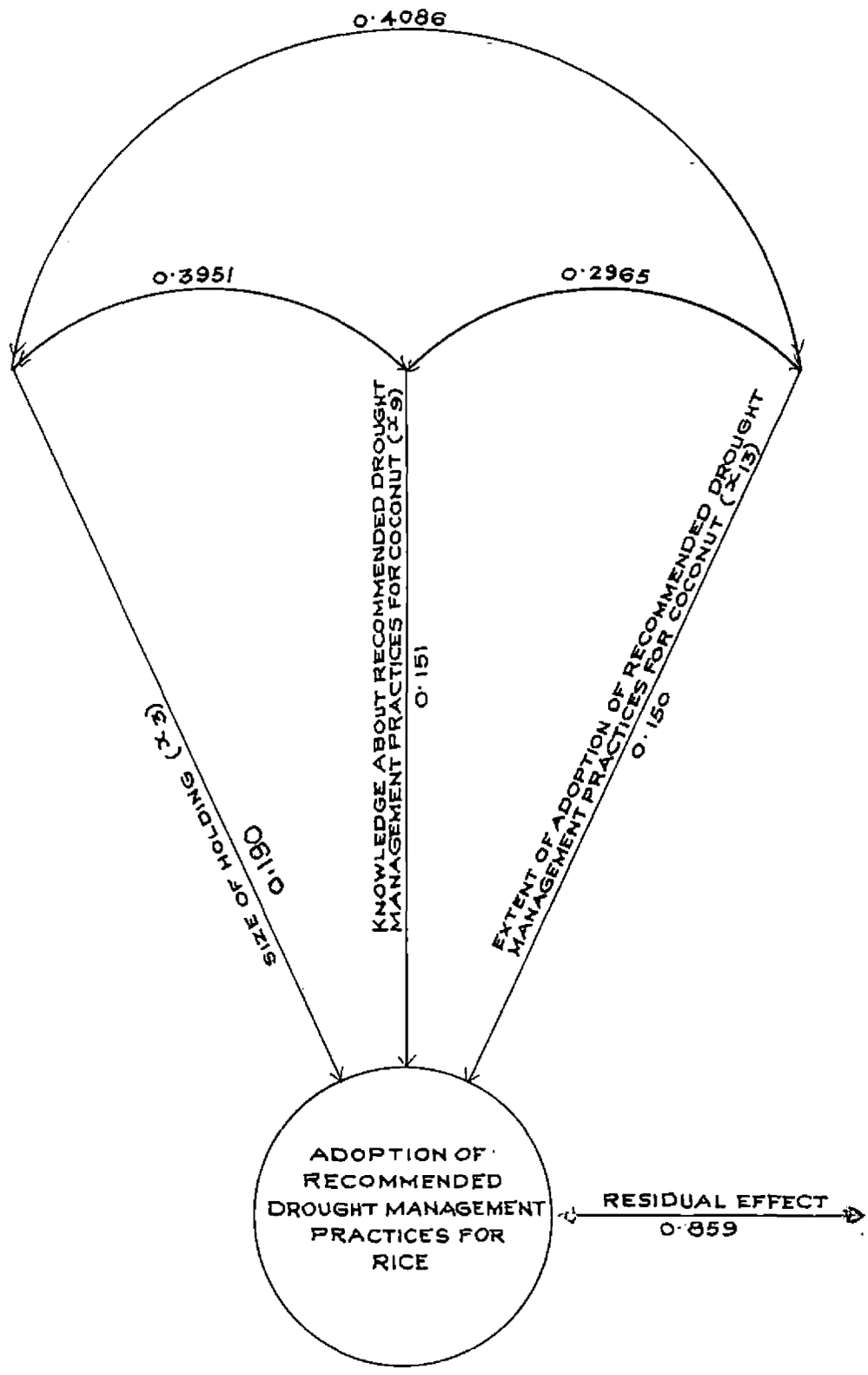

FIG. 9. PATH DIAGRAM AND CORRELATION STUDIES IN THE CASE OF EXTENT OF ADOPTION OF RECOMMENDED DROUGHT MANAGEMENT PRACTICES FOR RICE.

The maximum positive direct effect was found for size of holding (0.19) followed by knowledge about recommended drought management practices for coconut (0.151). But a positive direct effect of 0.150 was observed for extent of adoption of recommended drought management practices for coconut.

The correlation of size of holding with adoption was 0.311though its direct effect was 0.19. The high correlation coefficient was due to its indirect effects through knowledge about recommended drought management practices for coconut and extent of adoption of recommended drought management practices for coconut.

The correlation of knowledge about recommended drought management practices to adoption was 0.271while its direct effect on adoption was 0.151. The high correlation was the resultant of its indirect effects through size of holding and extent of adoption of recommended drought management practices for coconut.

The correlation of extent of adoption of recommended drought management practices for coconut was 0.273while its direct effect was 0.150. The high correlation was due to its indirect effects through size of holding and knowledge about recommended drought management practices for coconut.

14. Path coefficients of selected independent variables on the extent of adoption of recommended drought management practices for coconut.

Path analysis was performed by taking the factors size of holding, annual income, knowledge about recommended drought management practices for coconut and extent of adoption of recommended drought management practices for rice with adoption of coconut by taking into consideration the significant correlation of these variables with adoption.

Table 21. Direct and indirect effects of component factors on the extent of adoption of recommended drought management practices for coconut.

(n = 120)

	X_3	X_4	X_9	X_{12}	Total
X_3	<u>0.140</u>	0.169	0.043	0.056	0.408
X_4	0.100	<u>0.238</u>	0.038	0.015	0.391
X_9	0.055	0.082	<u>0.110</u>	0.049	0.296
X_{12}	0.043	0.020	0.030	<u>0.180</u>	0.273

Note: The underlined figures show the direct effects.

X_3 - Size of holding.

X_4 - Annual Income.

X_9 - Knowledge about recommended drought management practices for coconut.

X_{12} - Extent of adoption of recommended drought management practices for rice.

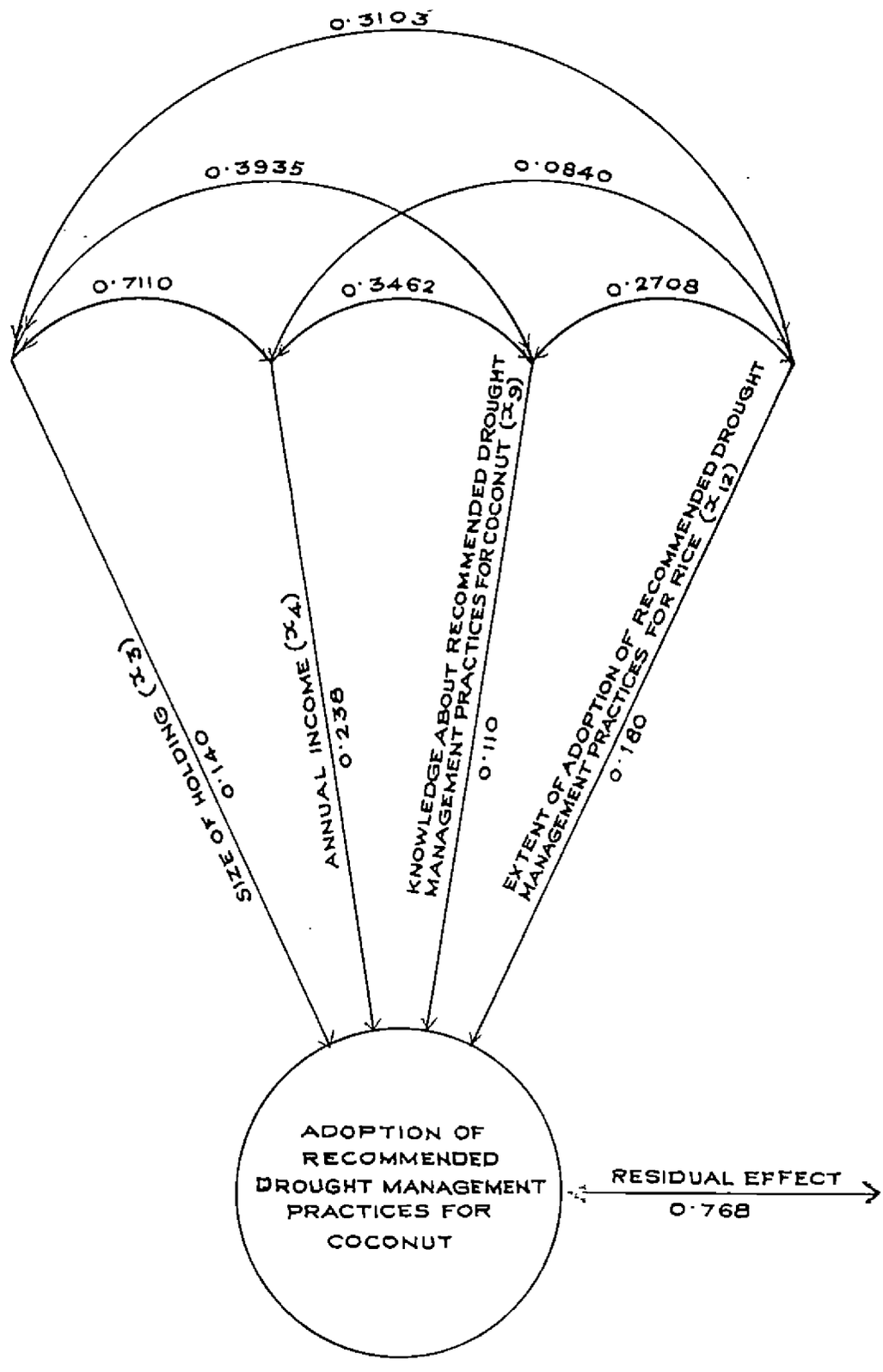

FIG. 10. PATH DIAGRAM AND CORRELATION STUDIES IN THE CASE OF EXTENT OF ADOPTION OF RECOMMENDED DROUGHT MANAGEMENT PRACTICES FOR COCONUT.

The maximum positive direct effect was found for annual income (0.24) followed by extent of adoption of recommended drought management practices for rice (0.18). Positive direct effect of 0.14 was observed for size of holding.

The correlation of size of holding with adoption was 0.408 eventhough its direct effect was 0.14. The high correlation must be due to its positive indirect effects through annual income, knowledge about recommended drought management practices for coconut and extent of adoption of recommended drought management practices for rice.

The correlation of annual income with adoption was 0.39 though its direct effect was 0.24. The high correlation was the resultant of its indirect effects through size of holding, knowledge about recommended drought management practices for coconut and extent of adoption of recommended drought management practices for rice.

The correlation of knowledge about recommended drought management practices for coconut was 0.296 while its direct effect was 0.11. The high correlation was due to its indirect effects through size of holding, annual income and extent of adoption of recommended drought management practices for rice.

The correlation of extent of adoption of recommended drought management practices for rice was 0.273 though its direct effect was 0.18. The high correlation was due to its

indirect effects through size of holding, annual income and knowledge about recommended drought management practices for coconut.

15. Constraints in the adoption of recommended drought management practices as perceived by the respondents.

Table 22. Constraints in the adoption of drought management practices as perceived by the respondents.

(n = 120)

Sl. No.	Constraints	Total constraint score	Constraint index (C.I.)	Rank
1.	Lack of finance	732	6.10	2
2.	Non-availability of inputs/equipment	668	5.56	3
3.	Lack of knowledge about technology	740	6.16	1
4.	Lack of proper training	523	4.35	4
5.	Non-availability of labour	516	4.30	5
6.	Lack of technical guidance	379	3.15	7
7.	Low price for output	418	3.48	6
8.	Uneconomic holding size	246	2.05	8

A perusal of data in Table 22 revealed that lack of knowledge about technology was perceived as the most important constraint by majority of the respondents (constraint index, C.I. = 6.16), next in the order of importance was lack of finance (C.I. = 6.10), the third constraint was non-availability of inputs/equipment (C.I. = 5.56).

Innovations on drought management have not reached the farmer's fully. Ineffective extension work remains to be the reason for the poor knowledge of the farmer's about the recommended drought management practices. With the recurrent drought situation, the Government, of late, are pursuing steps to enlighten the farmers about drought and management practices to overcome it. Since it is a late start the efforts have not yet percolated down to the farmers level even now.

Lack of finance and non-availability of inputs/equipment are constraints generally expressed by the farmers not only in the case of adoption of drought management practices but in agriculture as a whole. If the recommended drought management practices for rice and coconut are examined, it becomes clear that some of these practices do require sizeable financial investment in the form of purchase of inputs/equipment etc. In such contingent situations farmers could be expected to throw open lack of finance and non-availability of inputs etc. as major constraints felt by them.

Summary

CHAPTER-V

S U M M A R Y

Drought has been a constant visitor to Kerala since 1982. Due to tropical situation, erratic and uneven behaviour of monsoon, crops have been subject to failure either partially or completely, resulting in famine or conditions of scarcity.

The recurring drought situation in the state warrants a long term action plan so as to ensure that agricultural production is not adversely affected to any great extent. It is only possible with the intelligent management of the crop husbandry practices, the farmers will be able to overcome the ill-effects of the drought situation. The agencies charged with the responsibility of developing and extending technology packages which can help the farmers to achieve economic agricultural production amidst failures of monsoon, have a crucial role to play in this respect. An analysis of the awareness about and adoption of the drought management practices by the farmers will help to streamline the future endeavours in the State in this regard. Therefore, this research study was conducted with the following specific objectives:

i) to study the existing drought management practices followed by farmers for major crops (Rice and coconut);

ii) to find out the knowledge level of farmers about recommended drought management practices;

iii) to find out the extent of adoption of recommended drought management practices by the farmers;

iv) to find out the awareness of the farmers about the drought-proneness of crops and knowledge of the farmers about the parameters of drought;

v) to analyse the relationship between the socio-economic and psychological characters of the farmers with the extent of adoption of recommended drought management practices; and

vi) to identify the constraints experienced by the farmers in the adoption of drought management practices.

The study was undertaken in Palghat district which has the maximum area under semi-arid conditions. Out of the four agricultural sub-divisions of Palghat district, Chittoor agricultural sub-division was purposively selected. Chittoor agricultural sub-division consists of 26 panchayats and two municipalities. Out of these, two panchayats namely Pattencherry and Peruvemba were randomly selected. The list of farmers having rice and coconut cultivation were obtained from the above panchayats. From each panchayat three wards were selected randomly and from each ward 20 respondents were selected at random. Thus, the study was conducted among 120 respondents. The independent variables selected

for the study were age, education, size of holding, annual income, knowledge about recommended drought management practices for rice, knowledge about recommended drought management practices for coconut, risk orientation, economic motivation, scientific orientation, awareness of the farmers about the drought proneness of crops, knowledge about the parameters of drought and when the adoption of recommended drought management practices for rice becomes dependent variable, adoption of recommended drought management practices for coconut becomes independent variable and vice-versa.

The dependent variable of the study was the extent of adoption of recommended drought management practices for rice and coconut. The variables were measured by using scales - some adopted and the rest developed - for the purpose. The data from farmers were collected by interviewing individually with the help of pre-tested schedule. The collected data were tabulated, analysed statistically and results interpreted.

The salient findings of the study are summarised and presented as follows:

1. Majority of the farmers were going for the cultivation of short duration varieties in the case of rice and mulching in the case of coconut to tackle the drought situation. Nearly 10 per cent of the farmers were practising dry

sowing in the case of rice and 45 per cent were following interspace digging for coconut. But 28 per cent of the respondents followed husk burial in the coconut garden.

2. Majority of the farmers belonged to the medium level knowledge group both in the case of rice and coconut. Majority of the farmers were aware of the practice of using seed at 100 kg/ha in the case of rice and 94 per cent of the farmers were aware of the practice that disturbing soil in coconut garden should not be done in the case of coconut. The practices of coconut like mulching, removal of weeds in the garden, providing shade for seedlings aged below two years were known to almost all farmers.

3. It was observed that majority of the respondents belonged to medium level of adoption category in the case of rice and coconut. About 45 per cent belonged to high group in the case of rice and 28 per cent in respect of coconut. Almost all the farmers were using seed at 100 kg/ha. None of the farmers was adopting application of 34 kg each of NPK/ha. Broadcasting of seeds also was adopted by large majority of the respondents. Majority of the farmers adopted mulching, cutting and removal of weeds in the garden. Only 28 per cent adopted husk burial in the coconut garden. Only very few farmers adopted drip irrigation practices.

4. It was found that the farmers were in the medium group regarding their awareness of the drought-proneness of

crops. Majority of the farmers belonged to the medium group with respect to their knowledge about parameters of drought.

5. It was found that size of holding, knowledge about recommended drought management practices for coconut and extent of adoption of recommended drought management practices for coconut were positively and significantly correlated with the extent of adoption of recommended drought management practices for rice while size of holding, annual income, knowledge about recommended drought management practices for coconut and extent of adoption of recommended drought management practices for rice were positively and significantly correlated with the extent of adoption of recommended drought management practices for coconut.

6. Results of path coefficient analysis showed that in the case of adoption of drought management practices for rice, maximum positive direct effect was contributed by size of holding followed by knowledge about recommended drought management practices for coconut. In the case of adoption of drought management practices for coconut, the maximum positive direct effect was due to annual income followed by extent of adoption of recommended drought management practices for rice.

7. Lack of knowledge about technology, lack of finance and non-availability of inputs/equipment were the three most important constraints in the descending order as perceived by the respondents.

Implications and recommendations

The following implications and recommendations emerge out of the findings of the present study.

Consequent to the arrival of the new watershed technology for effective watershed management, we are entering in to a new era to fight the hazards of drought and floods. Eventhough Kerala State is blessed with two monsoons having an average annual precipitation of 3300 mm, the recent years have witnessed serious drought situations. The ICAR has recently started focussing its attention on watershed management. The Karnataka and some other State governments have started projects for watershed development and issued guidelines on this issue.

The different dimensions for the totality development of the watersheds have not been included in this study for want of definite recommendations and guidelines issued by the Department of Agriculture so far. Any way, the department is now in the process of initiating activities based on the new watershed technology.

Effective exploitation of the ground water resources, construction of a series of water harvesting structures and the totality development of every micro-watershed on drainage pattern are to be taken up to solve the crucial problems of droughts occurring in the State of Kerala.

1) The knowledge about drought management practices for rice is very poor because the farmers are least bothered about rice cultivation since it is not a profitable crop enterprise. This points out to the need for a re-orientation in the agricultural price policy of the Government, so that rice cultivation could also become a paying farm venture.

2) Almost all the farmers were adopting drought management practices for coconut. The knowledge level about drought management practices for coconut was more than that of rice. The State Department of Agriculture should chalk out a suitable training strategy to impart knowledge to the farmers on drought management practices for the important crops.

3) The most important constraint perceived by the farmers was lack of knowledge about technology. This calls for timely and frequent training for farmers and extension personnel, so that they could be well acquainted with the latest drought management technology.

4) Demonstrations may be organised to convince the farmers about the benefits of the drought management practices for various crops.

Suggestions for future research

The present study is confined to only Chittoor Taluk of Palghat District. A comprehensive study may be undertaken covering almost all districts of Kerala.

The study is conducted in respect of rice and coconut only. This may be extended to other crops also.

Research may be started in the Kerala Agricultural University to evolve drought resistant varieties of various crops.

Constraints in watershed development programme in the micro-watersheds that are being delineated by the soil conservation unit of the Department of Agriculture may be studied.

Impact of watershed development projects now under experimentation in Karnataka State may be studied.

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Appendices

APPENDIX

ADOPTION OF DROUGHT MANAGEMENT PRACTICES - A CRITICAL ANALYSIS

Interview Schedule

1. Name of the respondent :
2. Address :

3. Panchayat :
4. Block :
5. District :
6. Age (in completed years) :
7. Educational level:-
   a) Illiterate :
   b) Can read only :
   c) Can read and write only :
   d) Upto Lower Primary :
   e) Upto Upper Primary :
   f) Upto Secondary :
   g) Above Secondary :
8. Size of holding : Upto 1 ha
   From 1.01 to 2.00 ha
   2.01 to 3.00 ha
   3.01 to 4.00 ha
   Above 4 ha
9. Area under Rice & Coconut: Rice: Coconut:
10. Annual Income : Upto 2000
    2001 to 4000
    4001 to 6000
    Above 6000
11. Are you now adopting any drought management practices? : Yes/No
12. If yes, which are the drought management practices that you adopt in the cultivation of rice and coconut : Rice:

    Coconut:

13. Knowledge about recommended drought management practices:-

a) Rice:

1) In drought condition paddy varieties of Suvarnamodan or Annapoorna is to be used	: Yes/No
2) What is the recommended dose of NPK/ha under drought condition	: Correct/Incorrect
3) Seed at 100 kg/ha is to be used under drought condition	: Yes/No
4) Broadcasting is to be done under drought condition	: Yes/No
5) Cultivation of Triveni and Annapoorna during third crop season is found beneficial in drought condition	: Yes/No
6) In upland system of paddy cultivation, name the varieties which are more suitable to resist the drought condition	: Correct/Incorrect

b) Coconut:

1) Disturbing soil in coconut gardens during summer should not be done	: Yes/No
2) Cutting and removal of weeds in coconut gardens will save the coconut palms from drought	: Yes/No
3) Mulching in the basins of coconut during summer is a preventive measure to withstand drought	: Yes/No
4) Husk burial in coconut gardens can save the coconut palms from drought	: Yes/No
5) Drip irrigation for adult coconut palms is advantageous in drought condition	: Yes/No
6) Pitcher type irrigation with mud pots for seedlings are to be used in drought condition	: Yes/No
7) Shade has to be provided for coconut seedlings below 2 years of age to withstand drought	: Yes/No

14. Please state the degree of agreement/disagreement or undecidedness with each of the following statements.

Risk Orientation

Sl.No.	Statements	SA/A/UD/DA/SDA
1.	A Farmer should grow larger number of crops to avoid greater risks involved in growing one or two crops.	
2.	A Farmer should take more of chance in making a big profit than to be content with a smaller but less risky profit.	
3.	A Farmer who is willing to take greater risk than the average farmer usually does better financially.	
4.	It is good for a farmer to take risk when he knows his chance of success is fairly high.	
5.	It is better for a farmer not to try new farming method unless most others in the locality have used it with success.	
6.	Trying entirely a new method in farming by a farmer involves risk, but is worth it.	

15. Economic motivation:

a) A farmer should work towards larger yields and economic profits.

b) The most successful farmer is one who makes the most profit.

c) The farmer should try any new farming idea which may earn him more money.

d) A farmer should grow cash crops to increase monetary profits in comparison to growing of food crops for home consumption.

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

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

16. Scientific Orientation:

a) New methods of farming give better results to a farmer than old methods.

b) The way of farming by our fore-fathers is still the best way to farm today.

c) Even a farmer with lots of farm experience should use new methods of farming.

d) A good farmer experiment with new ideas in farming.

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

f) Traditional methods of farming have to be changed in order to raise the level of living of a farmer.

17. Extent of Adoption of Recommended Drought Management Practices:

	Adopted
a) Rice:	
a) Use of Suvarnamodan or Annapoorna as paddy varieties	Yes/No
b) Application of 34 kg each of NPK/ha	Yes/No
c) Using seed rate 100 kg/ha	Yes/No
d) Cultivation of Triveni and/or Annapoorna during third crop season	Yes/No
e) Using of paddy varieties PTB-29 and PTB-30 in upland system of cultivation	Yes/No
f) Method of sowing - broadcasting	
b) Coconut:	
a) Practice of keeping soil in coconut garden undisturbed	Yes/No
b) Cutting and removal of weeds in coconut gardens	Yes/No
c) Mulching in the basins in the coconut gardens during summer	Yes/No

d) Husk burial in coconut gardens Yes/No

e) Drip irrigation for adult coconut palms Yes/No

f) Pitcher type of irrigation with mud pots Yes/No

g) Providing shade for coconut seedlings aged below 2 years Yes/No

18. Awareness of the farmers about the drought proneness of crops:

1) Rice is more susceptible to drought during the panicle initiation stage Agree/Disagree

2) Rice is more susceptible to drought during the tillering stage Agree/Disagree

3) Rice is more susceptible to drought during the flowering stage Agree/Disagree

4) Button shedding of coconut is caused due to drought also Agree/Disagree

5) Drooping of coconut leaves is caused due to drought also Agree/Disagree

19. Knowledge about the parameters of drought:

1) Drought occurs if the deficiency of annual rainfall is more than 25 per cent Yes/No

2) Drought can be avoided if the underground water is exploited fully Yes/No

3) Drought will occur if the onset of south-west monsoon delays Yes/No

4) Drought occurs due to the non-utilisation of natural surface flow water through rivers, rivulets and streams Yes/No

5) Drought occurs when the mean temperatures are consistently high Yes/No

6) Drought occurs when the wind speed during the winter season is high Yes/No

20. Constraints perceived by the farmers in the adoption of drought management practices:

Rank the constraints which you perceive as most important:

1) Lack of finance.

2) Non-availability of inputs/equipment.

3) Lack of knowledge about technology.

4) Lack of proper training.

5) Non-availability of labour.

6) Lack of technical guidance.

7) Low price for output.

8) Uneconomic holding size.

ADOPTION OF DROUGHT MANAGEMENT PRACTICES BY FARMERS - A CRITICAL ANALYSIS

By

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ABSTRACT OF A THESIS

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ABSTRACT

To assess the awareness and adoption of the recommended drought management practices for rice and coconut, a study was undertaken in Palghat district of Kerala State. The independent variables taken were age, education, size of holding, annual income, risk orientation, economic motivation, scientific orientation, knowledge about recommended drought management practices for rice, knowledge about recommended drought management practices for coconut, awareness about the drought-proneness of crops, knowledge about parameters of drought and extent of adoption of recommended drought management practices for rice and coconut. The dependent variables were extent of adoption of recommended drought management practices for rice and coconut.

Results revealed that majority of the farmers were going for the cultivation of short duration varieties in the case of rice and mulching in the case of coconut to tide over the drought situation. Majority of the farmers belonged to medium group in the case of knowledge about drought management practices for rice and coconut and adoption of drought management practices in rice and coconut cultivation. Majority of the farmers used seed at 100 kg/ha in the case of rice and mulching in the case of coconut. None of the farmers adopted application of 34 kg each of NPK/ha in the case of

rice. Only 28 per cent adopted husk burial practice in their coconut gardens. Only very few respondents adopted drip irrigation practice.

The results of the correlation analysis showed that size of holding, knowledge about recommended drought management practices for coconut and extent of adoption of recommended drought management practices for coconut were positively and significantly correlated with the extent of adoption of recommended drought management practices for rice, while size of holding, annual income, knowledge about recommended drought management practices for coconut and extent of adoption of recommended drought management practices for rice were positively and significantly correlated with extent of adoption of recommended drought management practices for coconut.

Majority of the farmers belonged to medium group with respect to their awareness about the drought-proneness of crops and knowledge about parameters of drought.

Results of path-analysis showed maximum positive direct effect was found contributed by 'size of holding' in the case of adoption of drought management practices for rice and 'annual income' in the case of adoption of drought management practices for coconut. Lack of knowledge about technology, lack of finance and non-availability of inputs/equipment were considered as the major constraints in the adoption of drought management practices for rice and coconut.