INDIGENOUS PRACTICES IN COCONUT FARMING IN THRISSUR DISTRICT

By

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THESIS

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VELLANIKKARA THRISSUR

Kerala

1996

DECLARATION

I hereby declare that the thesis entitled **Indigenous Practices in Coconut farming in Thrissur district"** is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, fellowship, associateship or other similar title of any other university or society

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To
My Loving Parents

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Introduction

CHAPTER-I

INTRODUCTION

Technology is often thought to be a product that is generated by researchers and flows down to farmers in a one-way linear process Studies have shown that too often the international research centres tend to think of farmers as the targets of technological transfer Scientists applaud those who accept their ideas and look upon the nonadopters as conservative or traditional Implicit in their efforts to modernize the traditional farmer and introduce new agricultural 'packages is the assumption that what is being introduced, by virtue of its being more scientific and advanced, is necessarily superior to varieties and agricultural practices which are evolved *in situ* The fact that some technology is not adopted is ascribed either to the failure of the farmers to appreciate its benefits or to bottlenecks in the transfer process

Biggs (1989) claims that too often scientists assume that the reasons farmers did adopt the new technologies were obvious and need not be studied He suggested that in some cases it might be more valuable to understand why some farmers adopted a practice than to know why other farmers rejected it

Farmers are no different than any one else They respond positively to opportunities that are rational from their perspective The key, then, is to start by understanding the farmers perspective (Atte, 1989) He pointed out that indigenous farmers have an inherent knowledge of their environment and they make use of it to develop their management strategies The complex system of rotations, multi

mixed inter and sequential cropping systems reflect the depth of knowledge of indigenous farmers

Farmers continuously conduct their own trials, partially adopt and adapt technologies to their specific circumstances and spread innovations through their networks Their own analysis of farming systems offer important insights, different from that of scientists

As an example, Schafer (1993) pointed out that farmers traditionally soak sorghum grain (*Sorghum bicolor* L) in wood ashes Some thought it was silly exercise Then biochemists discovered that the alkali conditions produced by this treatment caused a chemical change in some of the proteins in the seed This increased the digestibility of the sorghum

Such knowledge [called as indigenous knowledge, local knowledge, traditional knowledge, etc] gained through practical experience, past events, observations, experimentation, local culture and traditions reflects the dignity of the local people and puts them on an equal footing with the outsiders involved in the process of technology development For hundreds of years, farmers have done their own research and by integrating technology from different sources and continuing to adapt on their farms, they still do today (Roling, 1989) These are finely tuned to their ecological, economic, socio-cultural and political environment Indigenous knowledge can be the basis of sustainable development also Little use is made of this valuable resource

Only if we consider indigenous and cultural knowledge, will we be able to develop the most appropriate agricultural systems for the future

The ecologists approach to indigenous agriculture is that native traditional systems reflect centuries of adaptation to local ecosystems (Lambert and Wilde 1992) If the principles that make those systems work can be articulated then they can be augmented by appropriate policies and integrated with Western science to produce effective technologies

This existing knowledge of traditional agriculture should be consolidated and put together and the advantages of these practices should be brought to light This study is mainly an attempt at systematic documentation of these informations regarding coconut cultivation

Kerala is the land of coconuts Known as the Tree of Heaven (Kalpa Vriksha), coconut plays a substantial role in the economy of the State and hence the relevance of indigenous practices in coconut farming in Kerala needs no emphasis

With these in view, this research study was initiated with the following specific objectives

1 To identify and list out the various indigenous practices followed by the farmers
2 To assess the knowledge and evaluative perception of these practices by the farmers, researchers and extension personnel
3 To find out the extent of adoption of these practices by the farmers
4 To find out the relationship between knowledge and extent of adoption of indigenous practices with the various personal, socio economic and psychological characteristics of the farmers

Scope of the study

Research on farmers indigenous ecological knowledge reveals that farmers are knowledgeable about their environment and this knowledge can be used as a basis for solving environmental problems Farmers know things that scientists do not and vice versa Hence, the challenge is to bridge this gap so that knowledge can be shared for the benefit of both

The indigenous knowledge is the product of centuries of trial and error natural selection, experimentation and keen observation that can form farmers knowledge base on which researchers and extension workers can plan their research and development strategy While not scientific in origin, it is usually valid When we ignore either indigenous or cultural knowledge, research and extension programmes cannot fully succeed Understanding what farmers know and do can provide crop researchers with better insights into agriculture and the agro ecosystem mainly because, farmers have always integrated environmental, social, religious political and family values into agricultural production decisions Besides indigenous knowledge plays an important role in participatory approaches to sustain development and is the key to participation

There is an indigenous practice of applying wood ashes to fields infested with witch weed (*Striga lutea*) Schafer (1993) reported that the alkali in the wood ashes inactivated the chemical that signals the striga seed to germinate Thus, it is evident that the most important contribution of the scientists is to discover how to adapt traditional practices into modern practices It is not that modern technology should be completely discarded It is a fact that the technological explosion in Indian

agriculture during the recent years has brought the country on a threshold of a major breakthrough in agriculture But, its disadvantages are many Similarly, local knowledge may not be sufficient to understand all the problems, but local knowledge can not be ignored There can be a proper blending of both modern and indigenous technologies so that an ecofriendly, sustainable and productive agriculture system can be established

Successful cooperative activities between ethno-scientists (those who study indigenous knowledge) and the agricultural scientists have been undertaken in various foreign countries There are centres with the main goal as to gather, catalogue, and index indigenous knowledge studies, with special emphasis on fugitive literature

Though thorough studies are needed in this field, not a single study in this line has so far been conducted in Kerala

The first and most important objective of this study was the collection and documentation of all the available indigenous practices followed by the coconut farmers in the district Some of these practices are found to possess scientific rationality There are many practices which are worth studying Eventhough, in most of the cases, the elements causing the desired results are not known to any one, the farmers experience that these practices serve the purpose (eg control of a particular disease/pest)

It is expected that the study would help in formulating a strategy to ensure effective and meaningful use of these valuable informations by the researchers A systematic documentation of traditional farmers knowledge into an

information bank will be helpful for researchers extension workers and other farmers to draw enlightenment And it is hoped this study will provide the base for it

Limitations of the study

The present research forms a part of the Masters degree programme which is a single student investigation and hence has the inherent limitations in terms of time money and other resources Being a post graduate research work the study could be confined only to Thrissur district Moreover the study was confined to only one crop namely coconut However care has been taken to make the study as systematic and objective as possible

This study focuses on the indigenous knowledge of technical nature Sincere effort was taken in collecting all the available practices prevailing/prevailed in the district They are by no means exhaustive

Presentation of the thesis

The thesis is divided into five chapters including the present one The present chapter already covered the scope, objective and limitations of the study

The second chapter deals with review of literature relevant to the study

The details of the study area selection of respondents procedures adopted for development of the indices selection, operationalization and measurement of variables, tools of data collection and statistical techniques used are covered in the third chapter Methodology

The fourth chapter deals with the results of the study obtained and also discussion on the results in detail

The fifth and final chapter presents the summary and implications of the study The references, appendices and abstract of the thesis are given at the end

Theoretical Orientation

CHAPTER-II

THEORETICAL ORIENTATION

The prime focus of this chapter is to cull out theoretical and empirical information concerning the present study Only during the past few years researchers have been paying serious attention to the need and importance of indigenous knowledge system Not many research studies on this new emerging field were readily available to the researchers Besides, this research is the first of its kind in this State However, the available studies related directly or indirectly to the topic are reviewed and presented in this chapter under the following heads

2 1 Concept of indigenous practices

2 2 Studies on indigenous practices

2 3 Knowledge about indigenous practices and its relationship with selected characteristics of respondents

2 4 Extent of adoption of indigenous practices and its relationship with selected characteristics of respondents

2 5 Evaluative perception of indigenous practices

2 6 Conceptual frame work for the study

2 1 Concept of indigenous practices

Since time immemorial, the farmer has been diligent in carrying out experiments with plants, animals and tools and implements to optimise resource use and improve production, processing and storage The information thus gained over a period of time was passed on from generation to generation by word of mouth This

knowledge in today s parlance is called 'local knowledge , traditional knowledge or simply, 'indigenous knowledge' (Chitturaichelvan and Raman, 1991) Indigenous knowledge (IK) includes both technical and nontechnical fields covering various social and religious taboos, belief and customs, communication patterns, music ecology, vegetation, climate and so on

Verma and Dhukia (1991) have stated that IK was mainly inherited through the socio-cultural system, and was maintained and developed through the oral traditions, folk tales, proverbs etc It is proved that the system of farming presented this way was based on wisdom, and solid logics now find support from scientific studies too

Much of the traditional agricultural practices have very little of modern technology per se, but they epitomise the scientific-technological wisdom of generations after generations, and as such they have been naturalized and environ mentalized whereas, most of the know-how based on modern science and technology are sophisticated, if not complicated (Vasu, 1994) Simplicity is the very essence of IK

Some of the operations with which traditional knowledge is associated are, alteration of plant and crop architecture, biological control, cutting and burning adjusting crop density or depth or time of planting, planting diverse crops, fallow ing, flooding, mulching, multiple cropping, planting without tillage using organic amendments, planting raised beds, rotation, sanitation and manipulating shade and tillage, most of which are sustainable (Thurston, 1990)

2 1 1 Definitions for indigenous practices

Haskell *et al* (1981) point out that these are not primitive left overs from the past but are on the contrary systems finally tuned and adapted both biologically and socially to counter the processes of what are often harsh and inimical environments and often represent hundreds sometimes thousands of years of adaptive evolution in which the vagaries of climate the availability of land and water the basic needs of the people and their animals for food shelter and health have been amalgamated in a system which has allowed society to exist and develop in the face of tremendous odds

Indigenous knowledge is highly localized and restricted Local environmental factors and cultural conditions govern the evolution of indigenous knowledge These vary between countries regions and even farm to farm (Carter 1988)

Indigenous knowledge may also be defined as the sum total of knowledge and practices which are based on people s accumulated experience in dealing with situations and problems in various aspects of life and such knowledge and practices are special to a particular culture (Wang, 1988)

Local beliefs are vernacular terms also have meanings and can be helpful in describing ideas (Sharland, 1989)

Indigenous knowledge is unique to a given culture or society This knowledge is the information base for a society Indigenous knowledge is dynamic it changes through indigenous creativity and innovativeness as well as through con tact with other knowledge systems (Warren 1989)

2 1 2 Importance of indigenous practices

Rudramoorthy (1964) pointed out that a judicious combination of folk knowledge and scientific knowledge will help to speed up the adoption of improved practices by the farmers

According to Gupta (1972) the concept of no tillage farming is based on the rational belief that if nature can grow luxuriant vegetation such as forests without tillage, it should be possible for man to grow food crops without ploughing or at least with minimum use of the plough

Andrew (1978) noted that in Japan the level of agricultural technology has been raised steadily since the end of last century by means of indigenous research on the basis of existing plant resources and systems of production

Anonymous (1978) stated that it is important not to overlook the kind and extent of local knowledge, experience, technology, skills and institutions which exists in any total community Such resources can often be very valuable indeed

Knight (1980) has called for the systematic documentation of traditional farmers knowledge into an "information bank" from which agronomists, extension workers and other farmers can draw enlightment

Nand and Kumar (1980) concluded that it becomes necessary that the scientists investigate the rationality of each one of the technical beliefs held by farmers so that they can clearly accept or reject a technical belief

Srivastava (1980) opined that since traditional technologies have under gone a selective process over centuries of empirical testing, they are very likely to

represent optimal solutions, but only optimal for the particular conditions, constraints, material and needs in response to which they are developed The traditional tools and techniques should be studied systematically and organized effort made for improving their efficiency and productivity

Narasimhan (1981) opined that before the problems arising from the modernization of agricultural technology be considered, the status of folk knowledge and practices must be evaluated, only then it can be comprehensively updated

A number of traditional agricultural system which basically rely on indigenous knowledge are considered for productivity, sustainability, stability and equitability (Chitturaichelvan and Raman, 1991) Documentation of all the traditional beliefs assumes greater importance to understand the scientific rationale, to accelerate technical change, to enable better understanding of technology development and to increase awareness among youth and pride among farmers

Sandoval (1992) argues that there is a pressing need for the systematic documentation or "memory banking" of local farmers' indigenous practices with traditional varieties and supplementary crops While germplasm encodes genetic information that has evolved through time as a response to selection pressures, the minds of local farmers who have considerable experience in growing these crops are repositories of cultural information coded, time tested adaptations to the environment

Chitturaichelvan (1994) suggested that with the addition of farmers indigenous/traditional knowledge, the technologies developed get refined, the problems get restated and scientific solutions are evolved

Rajasekaran and Warren (1994) opined that IK can be used to fulfil socio economic needs and conserve biodiversity at the same time

From the above review it could be concluded that the indigenous practices are important in the process of agricultural development Maximization of production is the prime goal of agricultural development for which new technologies are created by experts in the field of agriculture The experts may consider the local practices while formulating technologies for increasing production

2 1 3 Constraints

Kilvin (1971) pointed out that traditional beliefs contribute to mental isolation and may operate as a strong obstacle to adoption and is likely to remain long term problem until they are overcome

Das (1984) reported that irrational attitude and beliefs discourage the spirit of enquiry and experimental and scientific outlook among the farmers hinder ing technological improvement and dynamism in all activities

Shatter (1989) listed out five constraints viz

Lack of professional respect between agricultural and ethnoscientists

The way each scientific area collects data

Difference in research publication demands

Lack of time and

Lack of talent among agricultural scientists to gather indigenous knowledge

Increase in population, shortage of land, continuous division of land holdings, decrease in productivity and crop production etc are identified by Bharara (1991) as some of the major constraints in adoption of IK

Reijntjes *et al* (1992) explained various limits to indigenous knowledge as follows

(i) IK is not uniformly spread throughout a community and individual aptitudes for strong traditional knowledge and generating new knowledge differ Each individual possesses only a part of the communities IK

(ii) In any case, farmers do not document their knowledge so that it can be made available to strangers Their knowledge may be implicit within their practices, actions and reactions rather than a conscious resource

(iii) Farmers' knowledge is limited to what they can sense directly, usually through observation, and what they can comprehend with their own concepts It may, therefore, be difficult for them to relate to processes which are new or affect them only very gradually or indirectly Eg population growth, deteriorating natural resources, external markets etc

(iv) Foreign technology, education, religions and values, marginisation of agriculture and other factors have led to the marginasation of farmers knowledge and ways of spreading it

(v) In situations where land is limited and the population continues to grow, the traditional ways of farming may no longer be tenable

2 2 Studies on indigenous practices

A study was conducted by Chakravarthy (1982) in villages of Thanjavur district of Tamil Nadu, on indigenous farm practices in paddy cultivation He classified the farmers in to three categories viz , small, medium and big farmers and studied their various socio-personal and socio-psychological characteristics in rela tion to the extent of adoption and perception

Lightfoot (1987) has identified three activities to be included in the method of study of indigenous practices viz , (a) detecting indigenous methods or research topics, (b) identifying participants in the activity and (c) monitoring the process

Gupta (1990) listed the following reasons for documentation of indige nous knowledge

- To understand scientific rationale

  To accelerate technological change

  To enable better understanding of technology development and development of newer concepts

  To increase awareness among the younger generation and develop appreciation for the traditional systems

  To revive and restore pride among the farmers themselves

Anabella *et al* (1991) were of the opinion that localized practices are significant inputs to be considered in the overall understanding and development of vital agricultural commodities of the less developed countries such as sweet potato

Bharara (1991) has identified certain traditional practices viz using crop residues leaves and manures and mulch growing legumes and fodder crops to control erosion and mixed cropping of cereals with legumes Protection from wind blast leading to erosion of soils and adding green manure in the fields were met with these

According to Gnanadeepa (1991) who has identified and categorized certain traditional beliefs some traditional beliefs may be rational and some of them have been scientifically proved by the scientists For example the traditional belief There will be no incidence of pests or diseases if neem cakes are applied has been proved as true by the IRRI scientists

Kanagasabapathi (1991) has reported the results of a case study conducted on traditional practices in dryland agriculture Many practices such as use of neem cake dissolved in cow s urine and use of ash or red earth for storage of pulse grains were reported as effective traditional practices Details of practices with possible scientific explanations and suggestions for further development were also discussed

Sanghi (1991) has illustrated a number of traditional farm management practices evolved by farmers to address the problem of risk due to drought wet weather, frost pests, disease and market rate Attempts have also been made to discuss about their relevance under the changing scenario in rainfed agriculture and also to impress upon the need for blending the traditional practices of risk manage ment with modern practices of high production

An attempt has been made by Talwar and Singh (1991) to study the rationality of indigenous seed and grain practices They were of the opinion that

indigenous knowledge has undergone evolutionary process In recent years, the recording and networking of local knowledge has gained momentum and the efforts are being made to seek possible explanations and scientific principles involved in the local practices

Balasubramaniam (1992) has identified, classified and described 25 indigenous practices followed by dryland farmers in Coimbatore district in Tamil Nadu, in eight major headings He has described the constraints as well as the advantages of these practices as expressed by the farmers

The potential of indigenous farming systems to adapt and continue to use resources in a sustainable way was commented on by Donnelly (1992) The enabling conditions and circumstances for the spread of indigenous systems and the processes which inhibit or prevent the development of these conditions were also discussed

Ozien (1992) has demonstrated the relevance of indigenous approaches to agricultural development in Subsaharan Africa, showing that Africa s traditionally inherited agricultural methods are productive, employment generating, pragmatic, adaptable and for health reason, better than chemical based intensive agricultural methods introduced from the West

Sandoval (1992) has attempted on documentation of indigenous technologies and belief systems in the cultivation of sweet potato in Bukidnon

Campilan (1993) has given a number of indigenous practices followed by the sweet potato farmers

A study in three villages of the Union Territory of Pondicherry revealed that indigenous knowledge systems can provide a frame of reference for strengthening agricultural extension programmes (Rajasekaran *et al* 1993) The findings of the study have led researchers to develop a framework for incorporating indigenous knowledge systems into agricultural extension organizations The authors have presented a methodological framework to incorporate indigenous knowledge systems into agricultural extension organizations for sustainable agricultural development in India

Rajasekaran and Warren (1994) have examined the diversity of the indigenous agroforestry systems practised by the people of the Kolli Hills Tamil Nadu identified the factors which force local people to engage in activities that erode those systems and formulated policy interventions designed to make effective use of indigenous knowledge to meet the socio economic needs and conserve biodiversity

Vasu (1994) has discussed various factors that go into the indigenous technologies in agriculture, health sciences and modern industrial sectors

Babu (1995) has enlisted some indigenous practices followed by homestead farmers on various crops In coconut the practices include fumigation of field use of cow s urine use of common salt application of sand in leaf axils and painting milk of lime on the stem

2 3 Knowledge about indigenous practices and its relationship with selected characteristics of respondents

Specific studies in this aspect were not conducted earlier The researcher could come across only a few studies which might possess some indirect relationship with the knowledge level of farmers

Selvanayagam (1986) reported that of the sixteen characteristics studied only education had a positive and significant relationship with the farmers degree of traditional belief Among the other characteristics personal localite exposure mass media exposure contact with extension agency cosmopoliteness fatalism scientism innovativeness and sociocultural linkage had positive but non significant relationship with the degree of belief On the other hand age experience in dryland farming exposure to traditional media man nature orientation rational orientation pro gressiveness traditionalism, economic motivation and risk preference had negative and non significant relationship

Age farming experience and fatalism scientism had shown positive and significant relationship with the degree of traditional belief in the study conducted by Gnanadeepa (1991) Education mass media exposure cosmopoliteness rational orientation and progressiveness traditionalism had possessed negative and significant relationship with degree of belief whereas, personal localite exposure contact with extension agency, risk preference, scientific orientation and innovativeness possessed negative and non significant relationship However, socio cultural linkage had posi tive but non significant relationship with degree of belief

As the literature furnished above were not sufficient in anticipating any concrete relationship between the knowledge about indigenous practices and the various characteristics of farmers it was impossible to formulate any hypothesis regarding the relationship of socio economic personal and psychological characteristics of farmers with their knowledge about indigenous practices Hence the selection of independent variables was to be done to find out what relationship each of them could possess with the knowledge about indigenous practices The

variables thus selected for inclusion in the study were age education main occupation area under coconut annual income experience in coconut farming exposure to information sources fatalism irrigation index social participation progressiveness traditionalism extension orientation economic motivation innovativeness cosmopoliteness rational orientation and risk orientation

2 4 Extent of adoption of indigenous practices and its relationship with selected characteristics of respondents

2 4 1 Extent of adoption of indigenous practices

Hoffer and Strangland (1958) reported that non adoption of approved practices in Michigan was due to conservation and traditionalism

A study conducted by Chakravarthy (1982) revealed that majority of farmers falling in small and medium category possessed low level adoption whereas majority of big farmers possessed medium level adoption of indigenous practices Some other notable findings of the study were

The small farmers had adopted more of the labour intensive practices viz use of indigenous wooden plough and digging field burrows and catching rats than other groups of farmers

The adoption level of cattle penning and green leaf manuring by big farmers was significantly high as compared to small and medium farmers

Balasubramaniam (1992) has presented the adoption level of each of the identified indigenous practices in percentage

The extent of adoption of each indigenous practice was given in percent age also by Babu (1995)

2 4 2 Relationship of extent of adoption of indigenous practices with selected characteristics of respondents

Chattopadhyay (1963), in his study of psychological correlates of adoption of innovations in farming, found that adoption behaviour was significantly correlated with conservatism and traditionalism

Lakshminarayan (1970) concluded that large number of adopters were fatalistic and have faith in Astrology, Karma and belief in rebirth

Ziaul and Mahboob (1974) pointed out that there was a strong negative relationship between fatalism of the farmers and their adoption of fertilizers ie higher the fatalism of the farmers, lower was their adoption of fertilizers

Relationship between socio-personal and socio-psychological characteristics of small, medium and big farmers and adoption of indigenous farm practices in paddy cultivation was studied by Chakravarthy (1982) The results showed that only two independent variables viz contact with extension agency and economic motivation had positive and significant correlation with the extent of adoption in the case of small farmers The other variables studied were age, education, caste, nature of family, income, social participation, adoption leadership, scientific orientation, overall modernity and cosmopoliteness which had no association with the extent of adoption by the small farmers

Another important finding is that, none of the selected socio-personal and socio-psychological characteristics of medium farmers as well as big farmers had any association with the extent of adoption

However economic motivation education and income had high direct effect on adoption level in case of all the three categories

The same variables selected for the dependent variable knowledge were used here also

2 5 Evaluative perception of indigenous practices

Variation in the perception of various indigenous farm practice attributes by small, medium and big farmers was studied by Chakravarthy (1982) The findings of the study can be summarized as follows

Small farmers perceived the indigenous farm practices to be more simple profitable cheap physically compatible and flexible than medium and big farmers

Medium farmers perceived that the attributes immediacy of return input availability cultural compatibility lower perceived risk and observability of indigenous farm practices are more than the other groups of farmers

Big farmers did not perceive high of indigenous farm practices in respect of any of the attributes

Indigenous farm practices in general were perceived to be more culturally compatible safe, physically compatible simple and flexible

There was no significant difference between small and medium farmers and also between medium and big farmers in the perception towards simplicity of indigenous farm practices, but there was significant difference between small and big farmers

There was no significant difference in the perception towards the cost of indigenous farm practices between the three groups

All the three categories of farmers felt that the contribution of indigenous farm practices to the immediacy of return was very low No significant difference was there between the three groups

Besides the above stated study, the researcher could not find any study regarding the perception of farmers about indigenous practices Hence, the dimensions of evaluative perception were to be selected and included according to judges rating only Thus, the dimensions were selected in the present study including some from the above review

2 6 Conceptual frame work of the study

The main objective of a conceptual frame work being developed in this study is to provide an abstract view of the knowledge and extent of adoption of the respondents on indigenous practices and their interaction with personal, socio economic and psychological characteristics The frame work is expected to facilitate theoretical and empirical analysis of the knowledge and extent of adoption of the respondents (Fig 1)

It is an accepted fact that knowledge and extent of adoption are influenced by personal, socio-economic and psychological characteristics of the respondents These factors are intricately associated with each other and hence, a wholistic view of all these contributing factors only would give a clear picture of the dependent variables viz knowledge and extent of adoption

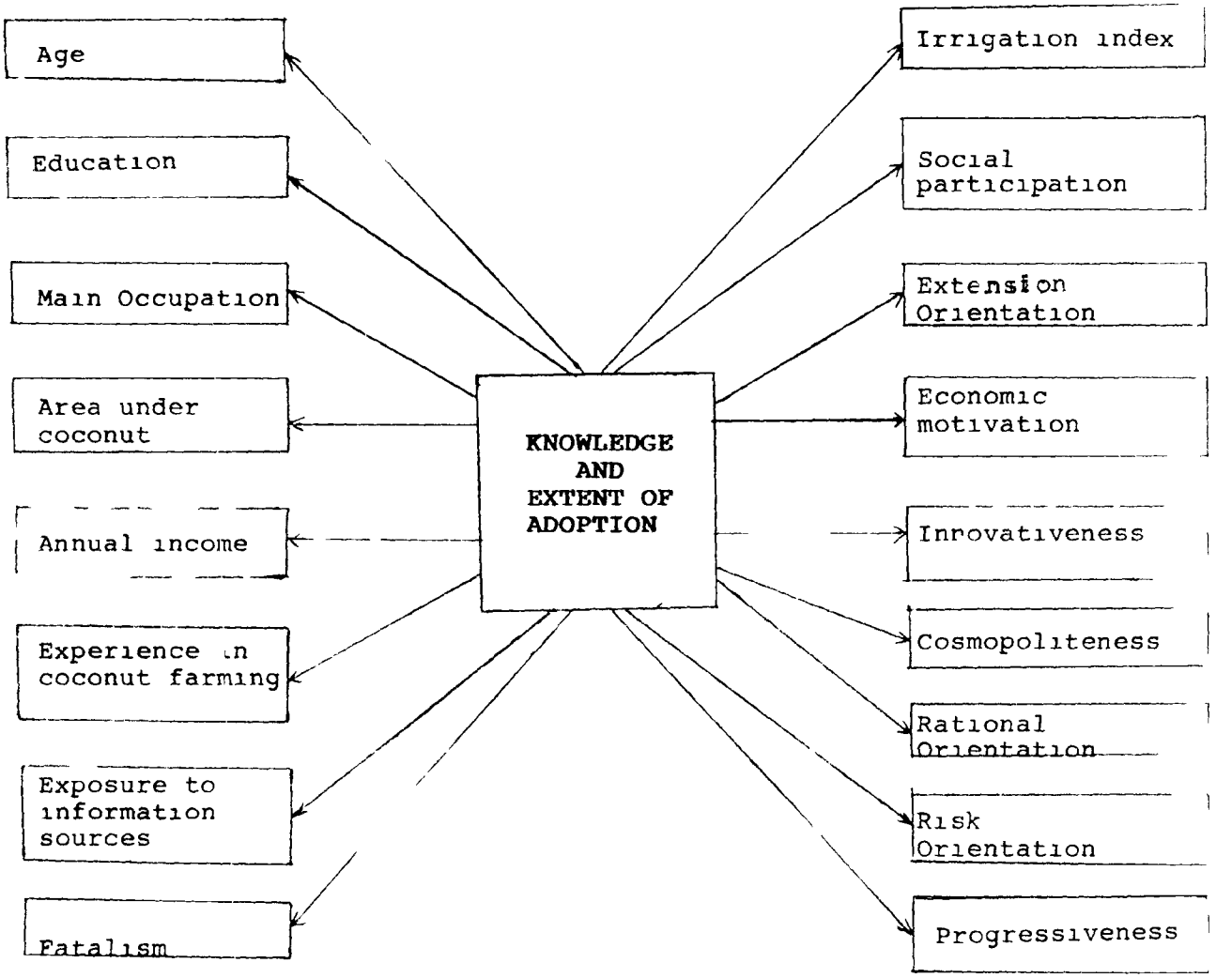


Fig.1 Theoretical model of the study

Methodology

CHAPTER-III

METHODOLOGY

The methodology followed in the study is presented under the following heads

3 1 Research design

3 2 Locale of the study

3 3 Selection of the sample

3 4 Operationalization and measurement of variables

3 5 Methods used for data collection

3 6 Statistical tools used for the study

3 1 Research design

This study was conducted adopting an *ex-post facto* research design *Ex post facto* research is systematic empirical enquiry in which the scientist does not have direct control over the independent variables because their manifestations have already occurred or because they are inherently not manipulatable (Kerlinger, 1964)

Inferences about relations among variables are made without direct intervention, from concomitant variation of independent and dependent variables In this research study since the manifestation of the independent variables had already occurred and there was no scope for manipulation of any variable, *ex post facto* research design was resorted to

3 2 Locale of the study

The study was conducted in Thrissur district of Kerala Thrissur district was selected as the locale of the study for the following reasons

1 Thrissur district ranked first among all the districts of Kerala in the yield of coconut per palm per year

2 There were traditional coconut farmers and pockets of potential coconut cultivation in the district

3 It was convenient for data collection considering the proximity of the area to the researcher

The study covered all the three agricultural sub divisions of the district viz Thrissur, Wadakkanchery and Irinjalakkuda

One panchayat with maximum area under coconut cultivation from each agricultural sub division was selected for the study The panchayaths thus selected were Kodassery Punnayoor and Arimboor Map showing the area of study is presented in Fig 2

3 3 Selection of sample

The unit of analysis for the present study was a coconut farmer From each of the selected panchayaths 40 coconut farmers were selected using simple random sampling procedure Thirty extension workers and all the available scientists (30) working on coconut were also selected

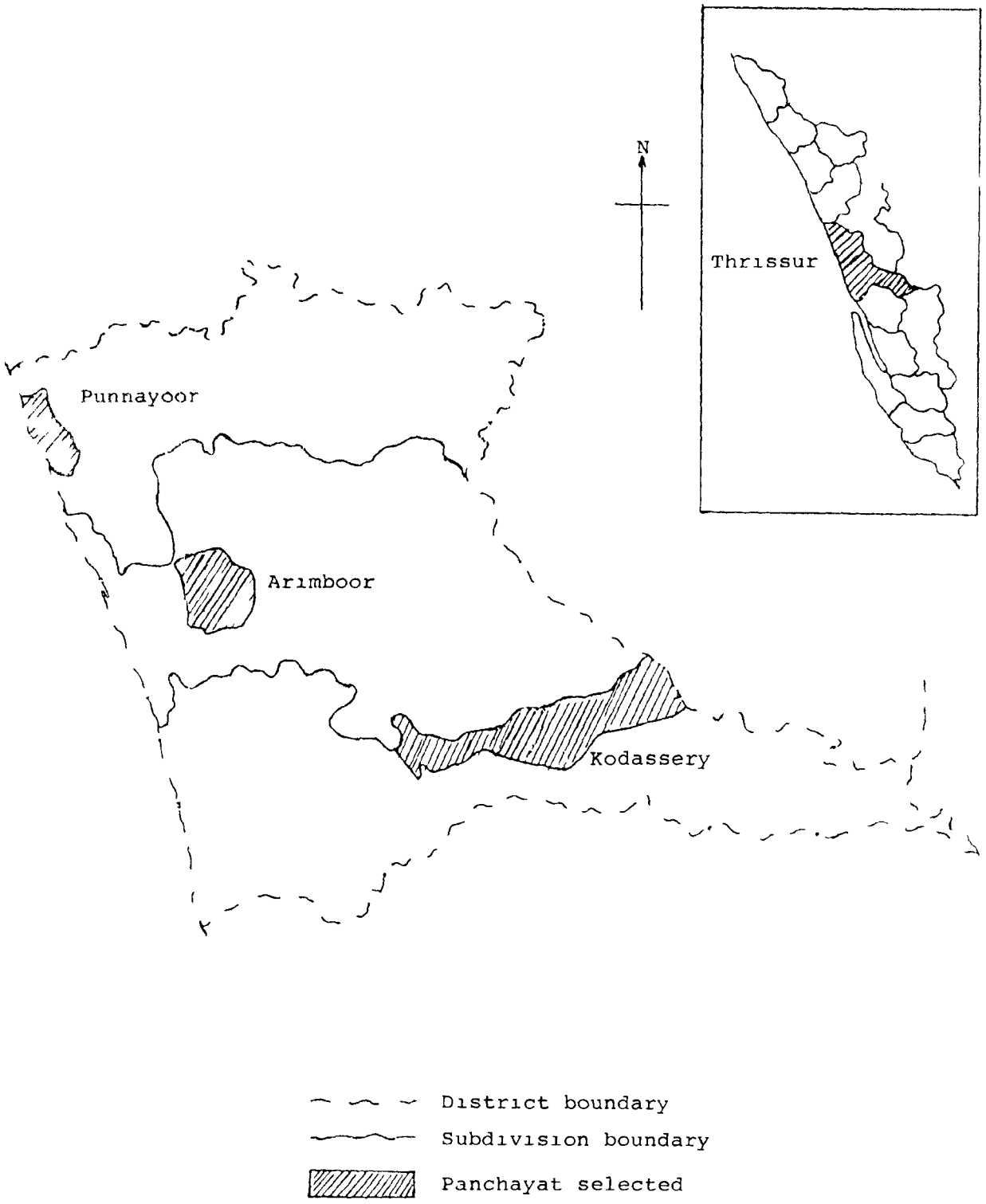


Fig.2 Map of Kerala showing the district and panchayats selected

3 4 Operationalization and measurement of variables included in the study

3 4 1 Operationalization and measurement of dependent variables

1 Knowledge about indigenous practices

This variable refers to the extent of information possessed by the respondent on indigenous practices

The variable was measured using a knowledge test developed for the study The steps followed in developing the knowledge test are given below

Collection of items

The content of a knowledge test is composed of questions called items In the present study, the items consisted of the list of indigenous practices collected during the first stage of investigation Thus 83 indigenous practices in coconut farming collected from the eleven panchayats of the district constituted the items for knowledge test

Item analysis

The 83 items were checked to 30 respondents prior to the preparation of the final schedule The respondents were randomly selected coconut farmers who were altogether different from the sample selected for the main study and at the same time having identical conditions

Item analysis yields two kinds of information, item difficulty and item discrimination The index of item difficulty reveals how difficult an item is whereas,

the index of discrimination indicates the extent to which an item discriminates the well informed individuals from the poorly informed ones

The respondent was given score one if one item was known to him There was thus a possibility of respondents scoring a maximum of 83 points for all known practices and zero for all unknown practices

The scores obtained by the 30 respondents were arranged in the descend ing order of total scores from the highest to the lowest and the respondents were divided into three equal groups arranged in descendmg order of total scores obtained by them The three groups were G_1, G_2 and G_3 with ten respondents in each group For item analysis, the middle group namely G_2 was eliminated retaining only the terminal ones with high and low scores

The data pertaining to correct responses for all the items in respect of these two groups G_1 and G_3 were tabulated and the difficulty and discrimination indices calculated (Appendix I)

In the present study the items with $E^{1/3}$ values ranging from 0 30 to 0 80 were considered for final selection Thus 12 items/indigenous practices were selected for the final knowledge test

Reliability

The test retest method was used to test the reliability of the knowledge test All the 83 items of knowledge test were administered twice to 30 non sample respondents at 15 days interval The coefficient of correlation between the two test scores was 0 81 which was significant at 0 01 level This indicated that the reli ability of the test was high

Content validity of the test

Utmost care was taken in the stage I investigation itself to identify and list out all the available indigenous practices prevailing/prevailed in the district All the practices which could be collected by the thorough investigation were included in the test Hence, it was assumed that the test was considered to have content validity

Method of scoring

Twelve items/practices were included in the final schedule for measuring the knowledge Each respondent was given one score for the practice which is known to him and zero score for the practice which is unknown to him 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 12 and the minimum zero

The knowledge test developed for measuring the knowledge of farmers was used to measure the knowledge of the selected research and extension personnel also The same test was used so that a comparison of the knowledge scores of the three categories of respondents would be possible

2 Extent of adoption of indigenous practices

Extent of adoption is the degree to which a farmer has actually adopted an indigenous practice

As it was the first study of this kind in Kerala, it was necessary to develop an index to measure the extent of adoption by the farmers As little study on

this aspect of indigenous practices have been carried out so far, there were no criteria available for ranking them So the selection of practices for calculating the adoption index was a bit difficult The only alternative we could find was to approach the scientists who are working on the particular crop to suggest from the list, the practices which they thought to have some rationale

Thus the list of practices was administered to a group of scientists working on coconut and requested them to suggest twenty practices which they thought as important or worth studying Thus, the practices were ranked in the order of their preference and the first twenty practices were selected to be included in the final interview schedule for measuring the adoption index

Besides, all the 83 indigenous practices on coconut farming were ranked and given weightage within the subheadings of each cultivation practice

In the present study, adoption index was calculated as given below

$$AI = \frac{1}{S} \times \frac{\sum_{i=1}^{K} W_i}{n} \times L_1 \times A_1 \times 100$$

$$\sum_{i=1} W_1$$

where

AI = Adoption index

S = Number of subheadings

$\sum_{i=1}^{K} W_i$ – Sum of the weightages of the selected practices where K is the number of selected practices which is twenty

$\sum_{i=1}^{n} W_i$ – Total weightage of all the practices where n is the number of total practices which is 83

L_i – Proportion of years since when the respondent is following the i^{th} practice (value ranging from zero to one with 15 years as the limit)

A_i – Proportion of area in which the respondent is following the i^{th} practice (0-1)

3 4 2 Operationalization and measurement of independent variables

1 Age

This was operationaly defined as the number of years the respondent has actually completed at the time of the interview

This was measured by directly asking the respondent the number of years he/she has completed at the time of investigation

2 Education

This was operationalized as the extent of formal education acquired by a respondent It was measured by assigning scores for different levels of education The categorisation of respondents and the corresponding scores assigned were as follows

Level of education	Score
Illiterate	0
Primary school	1
Secondary school	2
Collegiate	3

3 Main occupation

The professional status of agriculture for a farmer respondent was measured by this variable It referred to whether agriculture was the respondent s primary occupation or not

The scoring procedure followed was

Agriculture as primary occupation	1
Agriculture as secondary occupation	0

4 Area under coconut

This refers to the area of land in acres under coconut cultivation possessed by the farmer respondent

5 Annual income

This indicates the total annual income expressed in rupees earned by the respondent from both farm and non farm enterprises put together

6 Experience in coconut farming

This variable was measured as the number of years since the farmer has been involved in coconut cultivation

7 Exposure to information sources

This refers to an individual's contact with various sources of information ie , his/her mere exposure to various sources and not influence or internalization of the message from those sources

Scores of 0, 1 and 2 were given for responses never, occassionally and regularly respectively for each information source

8 Fatalism

This variable was defined as the belief of the farmer that human situations and acts were predetermined by some super natural power and can never or little be influenced by individual violation or by act of anyone else

The scale developed by Verma (1970) was used in this study The scale consisted of five items on a four point continuum of which two were negative and the rest, positive The points of the continuum were strongly agree, agree, disagree and strongly disagree with weights 4, 3, 2 and 1 respectively for the positive items and reverse for the negative items respectively

9 Irrigation index

The extent to which coconut is being irrigated was measured by this variable The scoring procedure developed by Geethakutty (1993) was used with slight modifications Two dimensions, viz availability of irrigation water and area covered under irrigation were considered for the purpose The scores for these two dimensions were given as follows

1 Availability of irrigation water

Throughout the year	2
Partial availability	1
Never	0

2 Area irrigated

75 per cent and above	4
Between 74 99 and 50 00	3
Between 49 99 and 25 00	2
Below 25%	1

The scores obtained by a farmer for the availability of irrigation water and area under irrigation were multiplied to get the irrigation index

10 Social participation

It is operationally defined as the degree of involvement of respondent in formal and informal social organizations either as member or as office bearer which also includes their degree of participation in organizational activities

The scale used by Subramoniam (1986) was followed with necessary modifications to suit the present study

The scoring procedure is given below

1 Membership in organization

No membership in any organization	0
Membership in each organization	1
Officer bearer in each organization	2

2 Frequency of attending meetings

Never attending any meeting	0
Occassionally attending a few	1
Regularly attending all meetings	2

To obtain the final score of the respondent, the scores given as the member or office bearer were multiplied with scores given for attendance in the activities and added up for all the organizations

11 Progressiveness

It refers to the relative receptivity of a farmer towards modern values and practices The scale used by Balasubramaniam (1992) was adopted here to measure progressiveness

The scale consisted of three statements and the respondents were asked to state their agreement on a three point continuum The scores for the responses of each statement in terms of agree, undecided and disagree were, 3, 2 and 1 respec tively

12 Extension orientation

It is the extent of contact of a farmer with different extension agencies and their participation in various extension activities or programmes like meetings, seminars etc

Extension contact is operationalised as the frequency of contact of the individual respondent with different extension personnel such as Assistant Director of Agriculture, Agricultural Officers, Agricultural Assistants etc

Extension participation is the frequency of participation of the individual respondent in different extension activities for the past one year viz study tours, seminars etc

The procedure followed by Kareem (1984) with some modifications was used for scoring

13 Economic motivation

Economic motivation referred to the extent to which an individual is oriented towards achievement of the maximum economic ends such as maximisation of farm profits

This was measured using Supe's (1969) scale with modification in the scoring procedure Instead of a five point continuum of response, as developed by Supe, a dichotomy of agree or disagree response pattern was used in this study The scale consisted of 6 statements of which five statements were positive A score of 1 was assigned for the 'Agree' response and '0' score for 'Disagree' response in the case of positive statements The scoring procedure was reversed in the case of the negative statement The scores obtained on each statement were cumulated to obtain the total score of the respondent on this variable The maximum score that could be obtained by a respondent was six and minimum zero

14 Innovativeness

Innovativeness is operationally defined as the degree to which a farmer is relatively earlier in adopting new ideas The procedure developed by Singh (1977) was used to measure the innovativeness of a farmer The question asked was,

"When would you prefer to adopt an improved practice in farming?"

Three responses were given with scoring procedure as follows

1 As soon as it is brought to my knowledge 3

2 After I have seen some other farmers using it successfully - 2

3 Prefer to wait and take my own time 1

15 Cosmopoliteness

It is defined as the degree to which a farmer is oriented to his immediate outside social system, such as visiting to the nearest town, purpose of visit etc It was measured using the scale developed by Desai (1961) with slight modification The scoring procedure followed was as under

a) Frequency of visiting the nearest town

Twice or more times a week	5
Once in a week	4
Once in a fortnight	3
Once in a month	2
Very rarely	1
Never	0

b) Purpose of visit

All visits relating to agriculture	4
Some relating to agriculture	3
Personal or domestic matters	2
Entertainment	1
Any other purpose	0

The scores obtained were summed up to obtain the final score for the variable

16 Rational orientation

It is operationalized as the extent of rationality and scientific belief of a farmer in relation to the different scientific recommendations

The scale adopted by Viju (1985) was used to measure the rational orientation of the respondents

It consisted of a question, "What do you feel about the income and improvement in life?" Which was rated based on the responses as follows

Response		Score
1	Beliefs in stars and not in scientific recommendations	1
2	Beliefs in stars and in scientific recommendations	2
3	Beliefs only in scientific recommendations	3

17 Risk orientation

Risk orientation was operationalized as the degree to which the respondent is oriented towards the risk and uncertainity and he exhibits courage to face problems of risk

The scale developed by Supe (1969) was used to measure risk orientation of the respondent

The scale consisted of six statements of which two were negative The respondents were rated on a five point continuum with scores 4, 3, 2, 1 and 0 for their responses, strongly agree, agree, undecided, disagree and strongly disagree respectively The scores obtained on each statement were cumulated to obtain the total score Thus the maximum score that could be obtained for a respondent was 24 and the minimum zero

3 4 3 Operationalization and measurement of evaluative perception

Evaluative perception is defined as the meaningful sensation of the respondent about the worth, efficiency or value of indigenous practices in terms of the dimensions, sustainability, simplicity, profitability, efficiency, flexibility and input availability, based on their experience with the practice These six dimensions were selected and induced according to the rating of judges

The respondents were asked to give their responses for each dimension towards indigenous practices Scores of 0, 1 and 2 were given to the responses low, medium and high respectively The evaluative perception on each of these dimen sions was obtained by adding the scores The overall evaluative perception score of a respondent was obtained by summing up the scores of all the dimensions

The evaluative perceptions of the research and extension personnel were also measured using the same procedure Thus a comparison between the three categories of respondents on their perception scores was possible

3 5 Methods used for data collection

The data pertaining to the present study were collected in two stages

Stage I The first stage was meant for the collection of data pertaining to the first objective of the study ie the identification of indigenous practices in coconut farming in the district

For the purpose, thirty well experienced coconut farmers from various parts of the district were selected and interviewed With those informations the list of all the indigenous practices following/followed in the district was prepared A total of 83 practices/beliefs along with their constraints in adoption as identified by farmers were identified and tested

Stage II A pretested structured interview schedule was prepared for farmers, extension workers and for scientists for collecting the needed data The interview schedule was prepared after discussing with a group of experts and necessary modifications were made The data were collected through personal interview by the researcher using the final interview schedule

3 6 Statistical tools used for the study

The following statistical techniques were used in the analysis of the data

Correlation analysis

Correlation coefficient is a measure of the association between two variables The correlation coefficient was worked out to measure the relationship between two dependent variables (viz the knowledge and extent of adoption) and the different personal, socio-economic and psychological variables

In order to test the significance of the observed correlation coefficient, the students t test at (n-2) degrees of freedom was used

Multiple linear regression analysis (MLR)

Multiple linear regression analysis was done to find out the relative contribution of each of the significant personal, socio-economic and psychological variables to the knowledge and extent of adoption of the respondents

This gives the percentage of variation that a set of independent variables jointly explains in each of the dependent variables The high R^2 values and the significant F value suggest the desirability of the regression analysis in predicting the dependent variable

Step down regression analysis

This was done to know the relative effect of the independent variables in predicting the dependent variable and for elimination of unimportant variables

Test for proportion

This was used to test whether a significant difference existed between the farmers, extension personnel and scientists in their knowledge about indigenous practices and in their evaluation perception about the indigenous practices

Besides, mean, standard deviation, and simple percentage analysis were also carried out for simple categorizations and comparisons

The statistical analyses were done using the computer facility available at the Department of Agricultural Statistics, College of Horticulture, Vellanikkara

Results and Discussion

CHAPTER IV

RESULTS AND DISCUSSION

This chapter deals with the results obtained in this study and the discussion based on the results Keeping the objectives in view, the findings as well as the discussion on them are presented in the following sequence

4 1 Identification of indigenous practices followed by farmers in coconut farming

4 2 Knowledge of the farmers, extension workers and researchers about indigenous practices

4 3 Extent of adoption of indigenous practices by the farmers

4 4 Evaluative perception about indigenous practices by the farmers, extension workers and scientists

4 5 Relationship between the personal, socio-economic and psychological characteris tics of farmers and the dependent variables

4 6 Relative importance of selected independent variables in explaining the variation in the dependent variables

4 7 Empirical models of the study

4 1 Identification of indigenous practices followed by the farmers in coconut farming

The indigenous practices and beliefs identified in the first stage of investigation are categorized under eight sub headings

The description of the identified indigenous practices, opinions of subject matter specialists about these practices and the constraints in adopting each practice as identified by the farmers are discussed below

CATEGORY I SELECTION OF MOTHER PALMS AND SEEDNUTS

In the first category, only the beliefs of the farmers regarding the selection of mother palms and seednuts were included

(i) Mother plants with

1 Age between 35-40 years

2 25 30 or more nuts per bunch

3 Larger stem girth

(ii) Seednuts

4 Oblong nuts with bulged middle portion

5 Nuts with less fibre and more copra content

6 Nuts from the middle of the bunch

7 Nuts from the bunch situated in the North-East side of the palm

8 Nuts with larger eyes and

9 Nuts collected in summer

It should be noted that the first belief contradicted the modern recommendations As per the package of practices recommendations (KAU, 1993) palms with a minimum age of twenty years can be selected as mother palms But all the farmers insisted that mother palms should be of the middle age (ie 35 to 45 years) They attributed a maximum age of 70 years to a coconut palm

Regarding the third belief, controversy was there among the farmers themselves Most of the farmers believed that palms with larger stem girth should be selected whereas, a few farmers were of the opposite opinion

Beliefs numbered 2, 4, 5, 6 and 9 agreed with the scientific recommendations whereas the 7th and 8th ones were not studied till date

CATEGORY II COLLECTION AND TREATMENT OF SEEDNUTS

10 Seednuts let to mature on mother palms

The nuts selected as seeds were tied together using ropes to the leaf petiole and were left to mature on the palm itself Farmers believed that the nuts should be detached from the palm after attaining complete maturity The researchers also agreed with this

11 Seednuts brought down with the help of ropes or coir baskets

The mature nuts were not allowed to fall down They were detached from the palm carefully, tied with ropes or collected in coir baskets and brought down slowly Reason was that the embryo would be injured if the seeds were allowed to fall on hard ground However, in sandy soil, this was not being practised This practice is also being carried out in research farms and it possesses scientific rationality

12 Seednuts let to fall on straw bed or into water

Straw was spread thickly around the basin and the nuts were allowed to fall down on this thick bed so that minimum injury was resulted to the embryo

The same purpose was met if the basin is made deep and water is filled in it These two practices were followed in places with hard ground

13 Shade drying followed by soaking of nuts for one to two months

The collected nuts were not sown immediately They are dried in shade for around 15 days Then they are tied together and put in ponds or wells for more than one month This assisted the embryo in an easy penetration of the husk and thus, early and better germination was attained Scientists also, were of the opinion that soaking for one month would make the fibre soft, helping in early germination of the seednut

14 Detecting the functional eye by the float of nut on water

If the nut is put in a bucket of water, the mature nut will float on the surface almost horizontally The side above water level was marked with a piece of chalk and the test was repeated The marked side will always be on the upper side Thus one can determine the location of functional eye of the nut Nuts should be sown in the same position with the marked side facing upwards

15 Detecting the functional eye by the position of smaller stalk

The nut has two stalks - one long and the other short The position of the functional eye is in the direction of the smaller stalk

The two practices detecting the functional eye were not studied scientifi cally

CATEGORY III SOWING AND SELECTION OF SEEDLINGS

16 Vertical sowing and

18 Sowing in slanting position

Both of these were practised in different regions of the district In areas where sandy soil is predominant, slanting position was preferred while in places where hard ground is present, seednuts were sown vertically According to the farmers, water stagnation in the depression near the functional eye could be avoided if the nuts were sown in a little slanting position But those who prefer vertical sowing were of the opinion that germination was difficult and late from a slanting seednut because the sprout had to penetrate the thick fibre to come out where as in case of vertical sowing, this problem was not there

According to the scientists working on coconut, there can be three positions for sowing seednuts viz vertical, horizontal and slanting Each method has its own advantage Horizontal sowing is best because continuous contact between endosperm and the embryo can be attained, which is necessary for the nourishment of embryo But transportation of seedlings is a big problem Vertical sowing is suitable for that purpose Slanting position has the advantages of both the other methods of sowing and hence it is advisible

17 Sowing when coconut water content reduces to half

This was considered as the best stage for sowing If the nuts are over matured, coconut water dries up which ultimately results in the death of the embryo But this stage can be identified by experience only

19 Sowing in sand

In sandy soil, this is not needed But in other regions, thick sand beds were prepared in shade and nuts were sown in these beds

Scientific recommendation also, is that the seed beds should be prepared in sand

There was a major reason for not adopting all the above practices

Most of the Krishi Bhavans and various other sources supply ready-to transplant seedlings So, many farmers need not attempt to apply these practices/beliefs in practice

20 Selecting seedlings with thread (*Narola*)

Narola means the leaf having a fibre (thread) connecting the leaflets along the margin (Plate 1) Farmers experienced that the seedlings with "narola" were healthy and early bearers

Though studies on this aspect were not carried out, researchers were of the opinion that there could be some rationality behind this belief, as this thread was observed in properly managed seedlings Most of the high yielding varieties show this thread in their seedling stage

21 Sowing sword staged (*Katti Koombu*) seedlings

This was a practice, followed in almost all parts of the district *Katti Koombu* describes the age of seedling When the seedlings are of about three months

old, the leaves are not separated It appears like a knife (*Kattı* = knife) This is the *Kattı Koombu* or *Kalakombu* stage (Plate 2)

Farmers believed that the seedlings transplanted in this stage established easily as compared with older seedlings Regarding the older ones, the roots are to be pruned while transplanting But in *Kattı Koombu* stage, the roots do not pierce the outer cover of the seed Rooting occurs directly in the transplanted pit and so injury to roots can also be avoided

This stage is called as "sword stage" in modern agriculture According to the scientists, though this stage shows better establishment, it is not always advisable because, other criteria for selection of best seedlings should be avoided if the selection is done at this stage

However, seedlings of this stage resist strong wind, which is a major problem in many parts of the district

22 Collar girth of three "fingers"

One finger is approximately one inch The seedlings with three fingers of collar girth were considered as best

The collar girth is an important criterion in selection of seedlings according to scientific recommendations also (KAU, 1993)

CATEGORY IV TRANSPLANTING AND CARE OF SEEDLINGS

23 Transplanting in *Bharanı* day of *Kumbhom*

Bharanı is believed as the birth star of coconut

Kumbhom comes in the period approximately from the second half of February to the first half of March, which is the beginning of summer season As per the opinion of farmers, transplanting in this period had its own advantages The seedlings become well established before the onset of heavy monsoon The leaves separate by this time and they can function as any other normal plant

Adoption of this practice is difficult in regions where irrigation facilities are inadequate

24 Transplanting in *Karkadakavarcha*

Karkadakavarcha is the period when South West monsoon is ceased and the North East monsoon is yet to begin

A few farmers opined that this was a good time for transplanting coconut seedlings Soil is sufficiently wet after the South West monsoon and so, seedlings can establish easily North East monsoon is not so heavy and irrigating the seedlings hence, can be avoided Before summer, the plants will be established

This practice is prevailing in the fields rather than in garden land

25 Taking square pits of size 1½ *Kol* (1 *Kol* ≈ 0 75 m) each side

Kol is an old measurement of length, which comes approximately to 0 75 m This much sized square pits were taken in hard soils only If the pit size is small, penetration of roots becomes difficult

26 Taking circular pits of 1 *Kol* radius

In sandy soils, large pits is not a necessity Besides, circular pits can be conveniently prepared in such soils This practice is prevailing in the coastal sandy regions

27 Taking rectangular pit

In certain parts, rectangular pits were taken with the longer side in the East West direction and the shorter side in the South North direction This was done to minimise the direct sunrays reaching the pit

28 Application of a mixture of sand, salt and ash in pit before transplanting

Sand improves the texture of soil and facilitates easy rooting of seedlings Sald and ash are proven to possess germicidal properties Ash also effec tively controls termite attack Joseph *et al* (1993) observed that in rocky laterite soils, addition of common salt to pits before transplanting coconut seedlings, softend the laterite bed and helped easy penetration of tender roots

29 Taking *mangukuzhi* in the pit

Mangukuzhi, Kallakuzhi etc denote the small hole made in the pit which exactly fits the nut It keeps the nut firmly in place

30 Supporting the seedlings with the help of stakes and ropes

Various methods of staking and tieing were there One, two or three stakes were used to tie the seedlings The purpose is to prevent the seedlings from lodging

31 Shading with coconut leaves

The whole coconut leaf was plated and tied the ends together in a long cylindrical shape This was fixed above the seedling to provide shade in summer days and from grazing of animals (Plate 3)

32 Wick irrigation using clay pot and thread (*Thuriyittu nanakkal*)

It is a primitive form of pitcher irrigation/wick irrigation Various forms of this type of irrigation were present Basically, a hole was made at the bottom of a clay pot and a cotton thread was inserted into this hole Water in the pot comes out through the thread (wick) in drops This was placed in the seedling pit near the root zone

This is a very effective water saving method of irrigation especially in sandy soil where irrigation water percolates down quickly One pot full of water is sufficient for two or three days

CATEGORY V MANURING AND INTERCULTURAL OPERATIONS FOR ADULT PALMS

33 Husk burial

Burying coconut husk deeply in basins or in deep channels in the inter row space was practised by many of the farmers Coconut fibre pith was also used instead of husk This is already proved as an effective moisture conservation practice

34 Burial of pseudostem of banana and

35 Burial of salvinia/Icornia

Pseudostem of banana was cut into small pieces and buried in the basins Salvinia, Icornia etc collected from the fields or ponds were also used for the same purpose (Plate 4)

Salvinia is otherwise a very dangerous weed to field crops especially paddy It was successfully used as green manure cum moisture conservation technique by many farmers

Some farmers did not use raw banana pseudostem for they believed that it attracted pests They suggested that the well dried pieces of pseudostem should be used instead of raw ones

36 Fresh fish application

It is prevailing in the coastal areas where fish is available in plenty Many farmers believed it as a very good manure and that it was better than dried fish or fish meal The fresh fish when decay in basins, serve as hosts for certain worms When the fish dry up these worms also decay and become additional manure to the palm

37 Ash and cowdung application annually and

38 Green leaf manuring

Though these are traditional practices, now they are considered as part of scientific method of farming The importance of cowdung, ash and green leaf as manure needs no emphasis

39 Preparation of soil mounds (*Polikoottal*)

This is a practice followed by farmers in coastal and sandy regions (Plate 5)

Sand was made into small mounds of around two ft height The basins were levelled and the mounds were taken adjacent to the trunk itself The farmers perceived this as one of the most necessary practices in coconut farming Many advantages are indicated by the subject matter specialists Some of them are, as follows

* Moisture conservation This is the most important purpose The mounds are prepared when the North East monsoon just ceases The plot is levelled in the summer

It can be understood that the capillary pores through which water reaches the surface are broken twice - once during the preparation of mounds and secondly when the ground is levelled

* Weed control When the mounds are prepared, the surface soil with weeds goes to the bottom and this results in the destruction of weeds

* Pruning of surface roots As the mounds are taken from near the trunk of the palm itself, the surface roots, which are of no use to the palm are cut Thus growth of roots growing deep into the soil is enhanced

* Yet another advantage of this practice is the increased Nitrogen fixation in soil Lightening is a usual phenomenon in the North East monsoon season which helps

in Nitrogen fixation When soil mounds are prepared all over the land, surface area would be much more Nitrogen fixation is at a higher rate when surface area is more, which is beneficial to the palms

40 Preparing blocks in the plot (*Kattayum varambum*)

The whole plot was divided into small blocks by means of bunds of about ½ ft height and 3/4 ft breadth *Katta* means blocks and *varambu* means ridges/bunds (Plate 6) This was prepared before the onset of monsoon The water obtained during the rains was thus collected in the plot itself and allowed to per colate into the soil Soil, water and fertilizer runoff from the land is thus prevented

41 Taking pits or channels in the inter row spacing

Long canals in the inter row spaces was a common indigenous practice, still followed in many parts of the district (Plate 7) They serve the purpose of water reservoirs During the rainy season, water stagnation in the root zone can be avoided and, in summer, these water sources save the palms from severe drought

42 Opening and closing the basins according to the *njattuvela*

There was a strong belief among the farmers that the basins should be opened before the *Thiruvathira njattuvela*, which they insisted to follow strictly at any cost *Thiruvathira njattuvela* is the period between the last week of June and the first week of July As per the opinion of experts, this is a rational practice, as maximum quantity of rain water can be collected and made available to the palms by this Ash, cowdung, green leaf and kitchen waste are dumped in the basin during this time Two third of the recommended dose of fertilizer is also to be applied

during this period The basins are closed just before the onset of the next monsoon The organic materials added in the basins get decayed by following this practice

CATEGORY VI CONTROL OF DISEASES

(1) Wilting

43 Application of leaves of Strychnus (*Kanjiram*)

44 Application of crushed fruits of Mahua (*Marotti*)

45 Burial of mango leaves along with cowdung or river silt, and

46 Crushed onion + salt application on basins

The exact pathogen causing root wilt is yet to be discovered Still, the farmers experienced that the above practices helped in the control of root wilt to a considerable extent Availability of these trees was the only constraint in adopting these practices Both Strychnus (*Kanjiram*) and Mahua (*Marotti*) are already known to possess medicinal and insect repellant properties

One possibility pointed out by the experts is that the green leaf or seeds of these trees, cowdung, river silt etc can improve the soil texture and organic matter content to a greater extent This may in turn result in the control of the dis ease The subject matter specialists agree that it is worth studying whether the leaves or any other parts of the above trees viz Strychnus, Mahua or mango tree have any repellant or lethal action on the causal organism of root wilt disease

Application of crushed onion + salt was a widely adopted practice in root wilt affected regions Nearly three kg of small onion (waste skin of onion

collected from the vegetable markets is equally effective) along with around one kg of common salt is needed per palm Experts suggest that this practice, also is worth studying

(ii) Stem bleeding

47 Cashew Nut Shell Liquid (CNSL) application on the trunk and

48 Lime paste application on the trunk

Stem bleeding was controlled by dressing the wounded stem with CNSL or lime in the form of paste on the trunk The scientific recommendation is to apply coal tar or bordeaux paste on the portion after chiselling the affected tissues

(iii) Button shedding

49 Removal of alternate inflorescence

Button shedding can be due to a number of reasons Water and nutrient stress is one of them When the button formation is in excess as compared to the availability of plant nutrients, the plant itself sheds off the additional buds If one inflorescence is cut and removed, more quantity of nutrients and water can be made available to the existing inflorescences In this regard, according to experts, this practice can be rational

50 Burial of banana pseudostem in basins

Low organic matter content, poor texture of soil etc are some of the other reasons for button shedding

Banana pseudostem and leaves were cut into small pieces and dried in sun, and then buried in the basins Soil mulching, improving the organic matter content, raising the water holding capacity of soil and thus, improving the general vigour of the palms are attained by means of this practice

51 Ash application,

52 Dried fish waste + salt application,

53 Neem cake + salt application and

54 Salt application

All the practices were found as effective in controlling button shedding Proper irrigation was followed in case of all the above practices Proper manuring, soil management and other cultural practices are necessary in improving the general conditions of the palm, which can surely be achieved by following the above practices

Neem cake, besides acting as an organic manure, also increases the desirable microorganisms which suppress the harmful microorganisms and ne matodes causing diseases (Jothimani, 1994) Advantages of salt application was also emphasized by Joseph *et al* (1993) who observed that common salt made the trees more tolerant to leaf blight disease

CATEGORY VII CONTROL OF PESTS

(1) Termite control

55 Lime application for seedlings,

56 Salt + ash application in seedling pit,

57 Planting wild variety of arrowroot (*Koova*) in the basins,

58 Fenugreek seed application in pit and

59 Neem cake in the pit

Termites are major pests during the seedling stage Application of salt + ash mixture in the pit before transplanting was the most common practice followed in almost all parts of the district But in coastal sandy soil this was not practised, as termite attack was a rare phenomenon here This may be due to the presence of salt in the soil Here, only ash was applied in the pit before transplanting

Application of lime in the form of paste on the palm is to check termite attack in the adult stage

Wild arrowroot (*Koova*) possesses many medicinal properties Researchers were of the opinion that the root exudates of this plant might have some sort of repellant properties against the termites Further research in this aspect is needed to find out the actual factor, preventing termite attack

Same was the case with fenugreek seeds The seeds were crushed and added in the pit Some people added a handful of salt along with it (ie 1 1 propor tion)

However, high cost was the preventing factor in adopting this practice For this reason, now-a-days this is not practised by most of the farmers though they are aware of its advantage

Incorporating neem cake in the pit is rather a scientific recommendation in controlling termites, and the rationale behind the practice is of no doubt

(ii) Control of rhinocerous beetle

60 Sand + salt filling in leaf axils

A mixture of sand and salt in 3 1 ratio was used to fill in the leaf axils The sand particles get stuck in the cavity between the head and thorax of the pest Free movement of head is made difficult for the beetle by this According to certain farmers, only sand was enough in controlling the pest Scientists have opined that eradication of the pest was not possible using mere sand A contact poison like BHC is needed for this purpose Application of sand + BHC is the recommended practice to control rhinocerous beetle

61 Use of Ailathes (*Perumaram* or *Matti*) in cowdung pit and

62 Leaves of Vitex (*Karinochi*) in cowdung pit

Leaves of Ailathes (*Perumaram*), *Karinochi* etc were added in the cow dung pit to prevent the development of the pest larvae *Karinochi* is already known to have repellant properties against many pests Ailathes also might possess some such properties, which is worth studying

63 Use of beetle hooks

This is rather a recommended practice, followed by most of the tradi tional as well as modern farmers as a mechanical control of the pest

(iii) Rat control

64 Lime pasting on trunk and

65 Wrapping of trunk with polythene or tin sheets

Lime paste was applied around the stem upto a height of about eight ft Instead the stem was wrapped with polythene or tin sheets to a height of eight ft Both these practices are meant for preventing the rodents from climbing the palm But rat attack cannot be effectively controlled by this practice Rats reach the crown of trees by leaping from one palm to another Hence by protecting the trunk, efficient control cannot be achieved However Babu (1995) has reported that painting milk of lime on coconut palm was believed to have protective effect against sun stroke

66 Baiting with powdered prawn + cement

This is an excellant innovation of the farmers Fried and powdered prawn (dried fish was also used in some parts) was mixed with cement and kept in the tracts of rodents, or in the coconut leaf axils The principle behind this is that, cement gets clotted on contact with moisture in the alimentary canal, which ultimately leads to the death of rat, by physically blocking the alimentary canal

However, it depends upon how much cement is consumed by the rodent

67 Use of jaggery + cotton balls

This is another innovation of the farmers Jaggery was mixed with cotton

and made into small balls Cotton is nothing but cellulose, which is not digestible by rats This, on consumption, results in the death of the rodents

68 Rat trap made up of bamboo (*Kumbom*)

Use of rat trap is very common, and is an effective mechanical rat control method Various types of rat trap were in use *Kumbom* is a rat trap made up of bamboo This particular trap was the most common one used specially for coco nut In addition to bamboo of around 1½ ft length, iron wires, a twine/banana fibre and some feed stuff are the parts of this trap The trap was kept on the crown of the palm Rats are trapped in the hollow of the bamboo Much training is needed to handle the trap

69 Sprouted paddy seeds in poison

Paddy seeds are soaked in poisoned water and were tied in damp cotton clothes for sprouting When the seeds sprout, the radicles penetrate the clothe and stay in place The clothe was then cut into small pieces each bit containing the sprouted seeds and kept on the leaf axils on the palm These poisoned seeds kill rats on consumption

70 Poison in parboiled rice

Rat poison was dissolved in water and paddy seeds were parboiled in this water This parboiled rice is poisonous which, on consumption, kills the rats

71 Rice flour mixed with dried fish and poison

Mixture of rice flour + dried and powdered fish + rat poison was placed in the leaf axils in coconut shell containers

72 Glyricidia leaves in cooked rice

Glyricidia seeds and leaves are mild poisons Ground Glyricidia leaves and seeds were mixed with cooked rice and a little coconut oil and made into small balls

All these practices (69-72) include poison in paddy seeds or in cooked rice All of them are poisonous to other domestic animals also, especially to the poultry So utmost care is needed while using these baits If poultry birds or live stock happen to feed on them, their health may be affected So these baits are to be kept on the palm only

CATEGORY VIII SPECIAL CULTURAL PRACTICES

The last category included certain practices which were carried out for certain special purposes like increase in nut yield, care of unproductive palms etc

73 Lime application to avoid barren nut development

Farmers experienced that development of barren nut was much declined when lime was applied

The research personnel who work on the crop have suggested that more quantity of potash is recommended in reducing this problem However, whether this application increases the availability of potassium in soil is worth studying Though serious works are not conducted in this regard, according to soil scientists, there is a great possibility of increasing potassium availability with the application of lime in soil

74 Toddy tapping

Besides extracting toddy, this practice has contribution in raising the yield of unproductive palms Farmers used to subject less yielding palms for tapping for 1 or 2 years After that, if the buds were allowed to develop, they gave much higher yield, as compared to their earlier performance Probably nutrients which would have been otherwise wasted in the development of unproductive inflorescence could be saved to an extent by following this practice This might be the reason for the increased nut yield in later years

One disadvantage is that if the toddy, while extracting, happens to fall in the leaf axils, gets fermented which attracts pests

75 Stamping down the leaves

Coconut leaves positioned almost vertically upward were stamped down so that their angle with the stem becomes around 90° This was usually practised in nonbearing young palms

The practice is very much rational as per the opinion of the scientists Yield is highest when the leaves are positioned in such a way that maximum quantity of sunlight is reaching on them Another contribution of this practice is that the leaf axils are usually cleaned after stamping the leaves This may encourage an easy emergence of buds

76 Injuring or shaking the palm

The palms which donot start bearing even after 7 8 years were subjected to certain treatments like injuring the trunk with a knife, beating it with pestle shaking the palm with elephant, tieing coconut shells, chappals etc on the bark along with scolding the palm roughly Farmers observed that the palms start bearing after giving such shock treatments

It is a known fact that the palms located near the schools, hospitals houses etc are giving high yields even though they are given very poor care and management Aged people strongly believe that the palms obtain a sort of encouragement and a sense of being cared, when people frequently move to and fro However, scientists could not find any rationality behind such practices and beliefs

77 Splitting leaf petiole (*Patta polikkal*)

This was done in young palms to enhance trunk formation The lower leaves were cut and removed from the tree Around one metre length of the petiole was retained This petiole was, then, split longitudinally into two halves and retained on the palm

Cutting leaves near the stem is harmful to young palms However, this practice is carried out with minimum harm to the stem Obviously, the petioles dry fast and fall down, and an early formation of trunk is visible

Researchers have pointed out that very large stem girth at the base of stem is not beneficial for the palm Keeping this in mind, this practice can be attributed some rationale

78 Application of Mahua (*Marotti*) seed cakes in basins

It was applied not as a manure, but as a remedy for showing very low nut yield Farmers opined that yield and vegetative growth of palms were increased with this It is known that Mahua seed cakes have some sort of insect repellant and medicinal properties Much studies on its ingredients are not carried out yet

79 Application of river sand during summer

This is mainly practised in lateritic soils Sand was added to raise the tex ture and physical condition of soil (Plate 8) It is considered in modern agriculture also, that coconut palm prefers soils with higher content of sand

80 Burial of pieces of Pentanus (*Kaitha*) in basins

Yet another observation of farmers was that, less yielding palms gave surprisingly higher yields when buried cut pieces of Pentanus including stem and roots in the basins This is a very old practice, and about cent per cent farmers were aware of this practice and its advantage

According to many farmers, Pentanus is the best manure for coconut

The only constraint in adopting this practice was the lack of availability of Pentanus

Scientists were almost unaware of this practice and they could not find any rationality in it Any way, they agreed that as a green manure crop, Pentanus might have improved the general conditions of soil which, in turn, might have resulted in raising the nut yield

81 Burning coconut residues in the basin

Coconut residues like fibre, husk, shell, dried spathe and other parts of the palm were burnt in the basin for getting higher yield Fumigation of coconut garden was found to be a common indigenous practice by Babu (1995) also

It is known that for any crop, smoking enhances flowering and fruit set and it reduces pest attack Besides smoking, the palms also get ash by this method Unlike the subject matter specialists, farmers give importance to this ash as compared to the smoke According to them ash obtained from coconut wastes is of some special quality Researchers also agree that Potash content can be higher in this ash

Jothimani (1994) reported that the manure products obtained from coconut were rich in plant nutrients and the recycling of these minor products of coconut would add considerable quantity of organic matter to soil The study revealed that by systematically recycling these materials, it was possible to plough back 20 7 kg N, 10 5 kg P_2O_5 and 30 8 kg K_2O per hectare annually

82 Tieing coconut husk to trunk to aid climbing

This was a practice usually done to avoid injuring the trunk of healthy palm to aid climbing Coconut husk was tied at given distances to the trunk with its concave side facing out

This is generally done in palms kept for the purpose of tapping toddy

83 Burning the crown of unproductive palms

Unproductive young palms, or insect/disease affected palms were subjected to this practice Instead of cutting and removing the palm, they gave the palm a last chance to survive by burning the entire crown Two possibilities are there, as a result of this One, the palm gets completely burnt up and dies within a short period This indicates that the growing tip of the palm was not functional or it was already dried or decayed The other possibility is that the palm survives and starts growing with new and healthy leaves Once the palm survives from the fire vegetative and reproductive growth rate of the palm is surprisingly high

Though it seems as a crazy and destructive practice, many advantages are being pointed out by the researchers The growing tip (meristematic tissues) of the palm is not much affected if it is not already dried or decayed Besides the advantages of smoking as already cited, this practice performs a cleaning function by removing unwanted and harmful wastes, insect pests and their larvae

Another scientific explanation is that ethylene production is a result of intense smoking Ethylene is a hormone which enhances flowering in trees This may be a reason for increase in yield after this treatment

4 2 Knowledge of the farmers, research workers and extension workers about indigenous practices

4 2 1 Distribution of respondents based on their knowledge about indigenous practices

The distribution of farmers on their knowledge about indigenous practices is shown in Table 1 The table reveals that only 15 83 per cent of the farmers

Table 1 Distribution of farmers based on their knowledge about indigenous practices

n = 120

Category	Knowledge score	Frequency	Percentage
Low (below $\bar{X}$ SD)	Below 6 68	19	15 83
Medium (between $\bar{X} \pm$ SD)	Between 6 68 and 10 74	79	65 83
High (above $\bar{X}$ + SD)	Above 10 74	22	18 33
Total		120	99 99

$\bar{X}$ = 8 71 SD = 2 03

Table 2 Distribution of respondents based on their knowledge about indigenous practices

Category	Knowledge score					
	Farmers n = 120		Extension personnel n = 30		Research personnel n = 30	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Low ($\bar{X}$ SD)	19	15 83	6	20 00	7	23 33
Medium ($\bar{X} \pm$ SD)	79	65 83	19	63 33	10	33 33
High ($\bar{X}$ + SD)	22	18 33	5	16 66	13	43 33
Total	120		30		30	
	$\bar{X}$ = 8 710 SD = 2 03		$\bar{X}$ = 7 767 SD = 1 675		$\bar{X}$ = 6 267 SD = 0 907	

in the district belonged to the low knowledge category As high as 65 83 per cent of farmers belonged to the medium category

Scientific farming demands a thorough understanding of the package of practices to be followed in the cultivation of crops But regarding the knowledge about indigenous practices which is obtained mainly as an ancestoral property majority of the farmers possessed medium to high knowledge

The mean knowledge scores of the three groups of respondents are presented in Table 2 The mean knowledge score of the farmers (8 71) was the highest as compared to the other two groups The scientists had the lowest score which was only 6 267 The extension workers stood in between these two with a score of 7 767 probably because they had contacts with the rural community rather than the research workers The scientists who work on coconut are mainly engaged in generating new technologies in coconut farming and thus they might have ignored the traditional farmers knowledge

4 2 2 Knowledge about the selected indigenous practices by the respondents

Table 3 shows that two practices viz collection of seednuts in summer (96 67% 100% and 100% respectively) and bringing down the seednuts with the help of coir baskets/ropes (93 33% 100% and 100% respectively) were the most known practices when all the three categories taken together

The percentage was highest for the farmer respondents in the case of 10th practice ie use of rat trap called *Kumbom* (97 50%) They even knew the technique of using it and its principle The practice which was least known to the

Table 3 Knowledge about the selected indigenous practices by the respondents in percentage

Sl No	Items (practices)	Knowledge (%)		
		Farmers (n=120)	Research personnel (n=30)	Extension personnel (n=30)
1	Selection of mother palms with larger stem girth	79 17	20 00	6 67
2	Collection of seednuts in summer	96 67	100 00	100 00
3	Bringing down the seednuts with the help of coir basket/ropes	93 33	100 00	100 00
4	Shading the seedlings with coconut leaves	96 67	100 00	100 00
5	Fresh fish application	86 67	26 67	53 33
6	*Poli koottal* (preparing soil mounds in the plot)	93 33	93 33	63 33
7	Crushed onion + salt application for wilt control	44 17	10 00	33 33
8	Dried fish + salt application for button shedding	70 00	6 67	23 33
9	Sand + salt filling in leaf axils for rhinocerous beetle	94 17	100 00	100 00
10	Use of *kumbom* (Bamboo made rat trap)	97 50	96 67	86 67
11	*Patta polikkal* (splitting the leaf petiole after cutting the leaves)	79 17	6 67	43 33
12	Burning coconut residues in the basin	84 17	86 67	60 00

farmers was the use of onion + salt mixture for controlling wilt (44 17%) This practice is a recent innovation of the farmers, though it is indigenous in origin Probably, this is the reason for the less popularity of this practice among the farmers Still, it is to be noted that nearly half of the total farmers know about it, whereas, only ten and 33 33 per cent of respondents were aware about this particular practice in the other two categories

The table clearly indicates that all the selected indigenous practices except one were known to more than 70 per cent of the farmers

Cent per cent of respondents of the two categories, viz research and extension personnel possessed knowledge about four practices such as, collection of seednuts in summer, bringing down seednuts with the help of ropes/coir baskets, shading the seedlings with coconut leaves and sand + salt filling in leaf axils for rhinoceros beetle control Even though these practices were being followed traditionally by the farmers, these are now being considered as scientific The scientists understand the rationality behind these practices and they, now, use to spread them among the farmers

Percentage of researchers was the least in case of their knowledge about two practices viz 'dried fish waste + salt application' and 'splitting the leaf petiole' (*Patta polikkal*)

Selection of mother palm with larger stem girth' was the practice known to least number of extension workers The extension workers were aware that uniform stem girth is necessary for an ideal mother palm, but they do not think that mother palm should have larger stem girth The researchers were also of the same

opinion Still some of them were aware that such a belief existed among the farmers

4 3 Extent of adoption of indigenous practices by the farmers

4 3 1 Distribution of farmers based on their extent of adoption of indigenous practices

Table 4 depicts the distribution of farmers on the extent of adoption of indigenous practices

The table reveals that only 15 per cent of the farmers belonged to the low adoption category whereas 67 50 per cent of them (81 farmers/120) belonged to the medium adoption category and 17 50 per cent farmers were high adopters

More or less similar results were obtained in both knowledge and extent of adoption It could be guessed that farmers who were aware of the practices were also adopting those practices

4 3 2 Adoption of the indigenous practices in percentage

Green leaf manuring was the practice adopted by most of the farmers (94 17%) (Table 5) Thirteen practices out of twenty were adopted by more than 70 per cent of the farmers Other practices which were having above 90 per cent adop tion were, Application of sand + salt + ash mixture in pit before transplanting (91 67%), salt application in basins (92 50%) and use of beetle hooks for rhinocerous beetle control (92 50%)

Wick irrigation with clay pot was the practice least adopted (30 83%) This is a practice prevailing in the coastal sandy soil with less water holding capacity

Table 4 Distribution of farmers based on their extent of adoption of indigenous practices

n = 120

Category	Adoption index	Frequency	Percentage
Low (below $\bar{X}$ SD)	Below 9 232	18	15 00
Medium (between $\bar{X} \pm$ SD)	Between 9 232 and 13 862	81	67 50
High ($\bar{X}$ + SD)	Above 13 862	21	17 50
Total		120	100 00

$\bar{X}$ = 11 547 SD = 2 315

Table 5 Adoption of the selected indigenous practices by the farmers in percentage

n = 120

Sl No	Items/practices	Adoption (%)
1	Selecting seednuts with less fibre and more copra content	88 33
2	Seednuts left to manure on mother plants	87 50
3	Sowing seednuts in sand	85 83
4	Selection of seedlings with collar girth of three fingers	88 33
5	Application of a mixture of sand, salt and ash in pit before transplanting	91 67
6	Shading the seedlings with coconut leaves	89 17
7	*Thiriyittu nanakkal* (wick irrigation using clay pot and cotton thread)	30 83
8	Burial of Salvinia/Icornia in basins	41 67
9	Use of fresh fish as manure	34 17
10	Green leaf manuring	94 17
11	*Poli Koottal* (taking soil mounts)	34 17
12	*Kattayum varambum* (preparing blocks in the plot)	74 16
13	Salt application	92 50
14	Salt and ash application in pit for termite control	80 00
15	Sand + salt filling in leaf axils for rhinocerous beetle control	71 67
16	Use of beetle hooks	92 50
17	*Kumbom* (rat trap made up of bamboo)	45 83
18	Toddy tapping	42 50
19	*Patta polikkal* (splitting the leaf petiole after cutting leaves)	45 83
20	Application of river sand during summer	74 16

and high percolation rate In laterite region this is not needed Moreover many of the farmers own motor and pump for irrigation For these reasons the lowest percentage of farmers adopting this practice can not be considered as an indication that the farmers avoid irrigating the seedlings in summer

Same is the case with fresh fish application and soil mount preparation (34 17% for both) Both these practices were widely adopted in coastal sandy soil Reason for the wide application of fresh fish in the coastal regions was its availability there Farmers in interior parts of the District were also aware of its advantages, but they were not able to adopt it due to its lack of availability and high cost of transportation

In hard soils the farmers use to plough the entire plot after the North West monsoon The main purpose is moisture conservation But ploughing is not sufficient in sand Preparation of soil mound was the alternative found as effective by the farmers Soil itself is acting as a mulch here

4 4 Evaluative perception about indigenous practices by the farmers, extension workers and scientists

Evaluative perception was measured in terms of six dimensions viz simplicity, profitability, efficiency, sustainability, input availability and flexibility The findings obtained with respect to each dimension and the overall evaluative perception score obtained by the respondents are presented and discussed below

4 4 1 Evaluative perception score with respect to the six dimensions

1 Simplicity

It is evident from Table 6 that the majority of the farmers (44 17%)

Table 6 Distribution of respondents based on their evaluative perception about indigenous practices on the dimension "simplicity"

Category	Farmers (n = 120)		Research personnel (n = 30)		Extension personnel (n = 30)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
High	53	44 17	8	26 67	10	33 33
Medium	37	30 83	11	36 67	12	40 00
Low	30	25 00	11	36 67	8	26 67
Total	120	100 00	30	100 00	30	100 00

fell in the high perception category as compared to the other two groups where as only 26 67 per cent of research personnel came under this category Forty per cent of the extension personnel had a medium perception about indigenous practices on this dimension

Many indigenous practices such as preparation of soil mound in the entire plot, making ridges or bunds in the entire plot etc needed much effort However, in general farmers perceived indigenous practices as simple when com pared with the other groups

As the principle or rationality behind most of these practices is still unknown, the scientists might have perceived them as more complicated

2 Profitability

Fifty per cent of the research personnel perceive that indigenous practices were highly profitable However majority of farmers came under medium category on this dimension of perception It is interesting to note that only 15 per cent of the farmers perceived the indigenous practices as highly profitable whereas 40 per cent of them were of the perception that profitability is low (Table 7)

Many of the farmer respondents had complaints about the labour charges required in carrying out many indigenous cultural practices Soil mound preparation, preparation of basins application of river sand etc were some of such practices

Though many of the farmers were of the opinion that certain indigenous practices like crushed onion and salt application dried fish residue application, fenugreek seed application etc were very effective they were not

Table 7 Distribution of respondents based on their evaluative perception about indigenous practices on the dimension "profitability"

Category	Farmers (n = 120)		Research workers (n = 30)		Extension workers (n = 30)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
High	18	15 00	15	50 00	10	33 33
Medium	54	45 00	12	40 00	12	40 00
Low	48	40 00	3	10 00	8	26 67
Total	120	100 00	30	100 00	30	100 00

at all profitable under the present situation Research workers or extension workers may not be much aware of these difficulties

3 Efficiency

It is seen from the Table 8 that least number of the three groups perceived the indigenous practices as highly efficient However farmers and extension workers fell in the medium efficient category (45% and 46 67% respectively) while 60 per cent of the research workers perceived the indigenous practices as low in terms of efficiency

Modern technologies help the farmer to get desired results within a short period which are quite obvious There are many high yielding varieties and improved fertilizers which are obviously efficient as compared to indigenous ones These may be the reasons for the said result

4 Sustainability

Evaluative perception of the respondents based on the dimension sustain ability is presented in Table 9

Cent per cent of the research and extension workers were of the opinion that the indigenous practices were highly sustainable Majority of the farmers also agreed with this (62 50%)

Relevance of ecofriendly indigenous practices needs no emphasis Unlike the modern practices these only enrich the soil Environmental pollution is minimum and productivity of the land is not affected It is evident that farmers also are aware of this

Table 8 Distribution of respondents based on their evaluative perception about indigenous practices on the dimension "efficiency"

Category	Farmers (n = 120)		Research personnel (n = 30)		Extension personnel (n = 30)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
High	20	16 67	4	13 33	7	23 33
Medium	54	45 00	8	26 67	14	46 67
Low	46	38 33	18	60 00	9	30 00
Total	120	100 00	30	100 00	30	100 00

Table 9 Distribution of respondents based on their evaluative perception about indigenous practices on the dimension "sustainability"

Category	Farmers (n = 120)		Research personnel (n = 30)		Extension personnel (n = 30)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
High	75	62 50	30	100 00	30	100 00
Medium	42	35 00	0	0	0	0
Low	3	2 50	0	0	0	0
Total	120	100 00	30	100 00	30	100 00

5 Input availability

Input availability was perceived as high by 53 33 per cent of the researchers while majority of the farmers perceived it as low Only 20 83 per cent of farmers were under the high perception category Input availability was medium as per the majority of the extension workers (Table 10)

During the investigation the researcher could identify that many farmers were not following some particular indigenous practices only due to the lack of their input availability The best example is the application of pentanus in coconut basins Those who were aware of the practice had no doubt that the practice was highly effective in bringing out the desired results Earlier, pentanus was grown in the river banks and near the ponds, and it was available in plenty But now pentanus is not at all available in many parts of the district

As in the case of profitability, here also research and extension workers may not be aware of such problems Same is the case with many other practices, some of which are, application of leaves of Ailathes, Vitex, Strychnus etc

6 Flexibility

Flexibility was perceived as medium by majority of the farmers and research workers (51 67% and 60% respectively) (Table 11) At the same time, majority of the extension workers were of the opinion that indigenous practices were highly flexible Only 15 83 per cent of farmers perceived the indigenous practices as highly flexible

Table 10 Distribution of respondents based on their evaluative perception about the indigenous practices on the dimension "input availability"

Category	Farmers (n = 120)		Research personnel (n = 30)		Extension personnel (n = 30)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
High	25	20 83	16	53 33	6	20 00
Medium	45	37 50	12	40 00	13	43 33
Low	50	41 67	2	6 67	11	36 67
Total	120	100 00	30	100 00	30	100 00

Table 11 Distribution of respondents based on their evaluative perception about indigenous practices on the dimension "flexibility"

Category	Farmers (n = 120)		Research personnal (n = 30)		Extension personnel (n = 30)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
High	19	15 83	5	16 67	18	60 00
Medium	62	51 67	18	60 00	11	36 67
Low	39	32 50	7	23 33	1	3 33
Total	120	100 00	30	100 00	30	100 00

4 4 2 Overall evaluative perception of respondents about indigenous practices

A perusal of the Table 12 revealed that majority of respondents of all the three categories fell under medium perception category It should be noted that only 10 00 per cent of researchers were in the low evaluative perception category Around 17 per cent of both farmer and research respondents were having higher perception about indigenous practices (Fig 3)

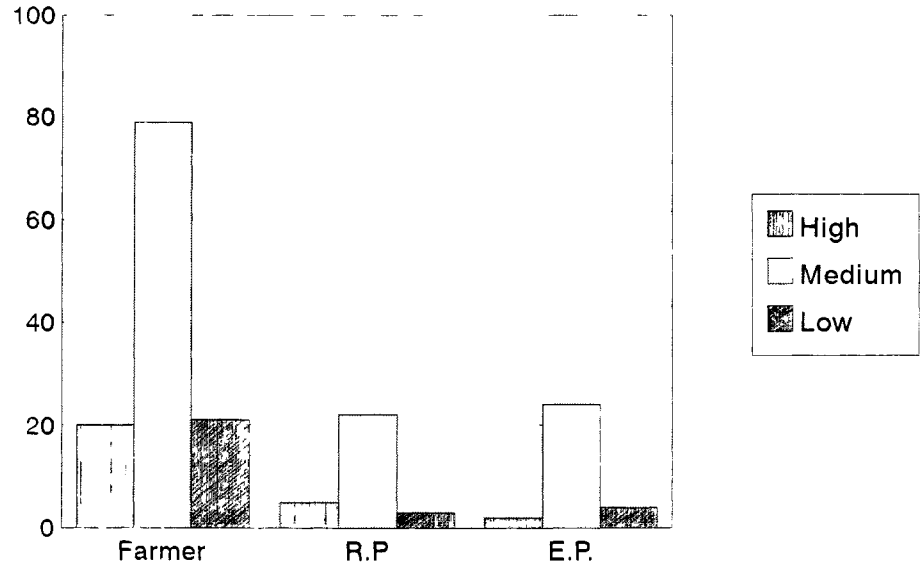
The results reveal that in general the overall evaluative perception of the three categories of respondents was quite appreciable It is only natural that for a perennial crop like coconut which is considered very dear to the Keralites the indigenous practices are considered as very critical Besides in the development of sustainable agricultural system indigenous knowledge should also be given importance during the formulation of new technologies for which participation of both farmers and subject matter specialists is necessary It depends on how do researchers and other subject matter specialists perceive these practices and how much importance they attribute to these informations In view of this it is quite remarkable that the researchers and extension personnel particularly had a better overall evaluative perception of the indigenous practices in coconut farming

This result contradicted the earlier results obtained when perception was calculated for each of its dimensions separately However it would not be wise to conclude that researchers have a higher perception about indigenous practices as compared to the other two categories This is evidenced from the earlier tables (Tables 6 11) Scores obtained for the dimensions like sustainability might have contributed much in getting such a contradictory result

Table 12 Distribution of respondents based on their overall evaluative perception about indigenous practices

Category	Farmers (n = 120)		Research personnel (n = 30)		Extension personnel (n = 30)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
High	20	16 67	5	16 67	2	6 67
Medium	79	65 83	22	73 33	24	80 00
Low	21	17 50	3	10 00	4	13 33
Total	120	100 00	30	100 00	30	100 00
	$\underline{n}$ = 120 $\bar{X}$ = 11 93 CD = 1 723		n = 30 X = 13 3 CD = 1 62		$\underline{n}$ = 30 $\bar{X}$ = 13 45 CD = 1 57	

Fig. 3. Distribution of respondents based on their overall evaluative perception about indigenous practices



R P = Research personnel , E.P = Extension Personnel

4 5 Relationship between the personal, socio-economic and psychological characteristics of farmers and the dependent variables

4 5 1 Relationship between the independent variables and the knowledge about indigenous practices by the farmers

The simple correlation analysis (Table 13) revealed that there was no significant correlation between the dependent variable and most of the independent variables Only one variable, ie education had a significant correlation with the knowledge of farmers Two variables viz social participation and risk orientation had negative and nonsignificant correlation with the dependent variable where as all the other variables had positive and nonsignificant relationship with knowledge

Coconut farmers are a bit different from the farmers who cultivate field crops They need not go to the coconut garden daily to carry out cultivation practices Education might have enabled these farmers to perceive the role and importance of the indigenous practices in farming especially in the present situation where many of the modern technologies are being found to be unsuitable in the long run

This finding is in agreement with the findings of Selvanayagam (1986) who found that education had significant positive relationship with the farmers degree of belief

Though not significant certain relationships are notable in the table

Main occupation and exposure to information sources are the two variables with a comparatively higher correlation coefficient

Table 13 Correlation between knowledge about indigenous practices by the farmers and the independent variables

n = 120

Variable No	Independent variables	Correlation coefficient (r)
1	Age	0 006 NS
2	Education	0 220*
3	Main occupation	0 145 NS
4	Area under coconut	0 031 NS
5	Annual income	0 060 NS
6	Experience in coconut farming	0 005 NS
7	Exposure to information sources	0 154 NS
8	Fatalism	0 118 NS
9	Irrigation index	0 118 NS
10	Social participation	0 057 NS
11	Progressiveness	0 002 NS
12	Extension orientation	0 098 NS
13	Economic motivation	0 015 NS
14	Innovativeness	0 017 NS
15	Cosmopoliteness	0 062 NS
16	Rational orientation	0 067 NS
17	Risk orientation	0 001 NS

* Significant at 5% level
NS Not significant

Table 14 Results of multiple linear regression analysis of knowledge about indigenous practices by the farmers and the independent variables

n = 120

Variable No	Independent variables	Regression coefficient	Standard partial regression coefficient	t value
1	Age	0 005	0 035	0 237 NS
2	Education	1 200	0 458	3 600 **
3	Main occupation	0 920	0 151	1 470 NS
4	Area under coconut	0 030	0 203	1 241 NS
5	Annual income	0 101	0 108	0 822 NS
6	Experience in coconut farming	0 000	0 245	1 767 NS
7	Exposure to information sources	0 110	0 178	1 743 NS
8	Fatalism	0 084	0 050	0 464 NS
9	Irrigation index	0 013	0 024	0 209 NS
10	Social participation	0 014	-0 022	0 156 NS
11	Progressiveness	0 168	0 111	0 899 NS
12	Extension orientation	-0 060	-0 092	0 674 NS
13	Economic motivation	0 120	-0 064	0 535 NS
14	Innovativeness	0 113	-0 029	0 253 NS
15	Cosmopoliteness	0 122	0 115	0 750 NS
16	Rational orientation	0 118	0 025	0 231 NS
17	Risk orientation	-0 033	0 066	0 548 NS

** Significant at 1% level
NS - Not significant
Intercept 3 54
R^2 0 185
F value 1 36

It is quite understandable that the farmers whose main occupation is agriculture have a higher knowledge as compared to those with some other main occupation Similarly, exposure to information sources especially family members, neighbours and print media might have made the farmers aware about various indigenous practices prevailed in the region

The results of multiple linear regression analysis are presented in Table 14

The R^2 value indicated that seventeen variables taken together explained only 18 50 per cent of variation in the dependent variable The F value was also found to be not significant which would mean that a linear functional relationship between the independent and dependent variables could not be established here

The value of regression coefficient for the variable education was found to be significant and positive This suggested that a unit increase in education would increase the knowledge by 1 200 units provided other variables were kept constant

4 5 2 Relationship between the independent variables and the extent of adoption of indigenous practices by the farmers

Table 15 reveals the simple correlation analysis between the extent of adoption and the various socio-economic characteristics of farmers

It can be observed that as, in the case of knowledge, here also, majority of the variables possessed no significant relationship with the dependent variable Exposure to information sources was the only variable which possessed a positive and significant relationship with the dependent variable

Table 15 Correlation between extent of adoption of indigenous practices by the farmers and independent variables

n = 120

Variable No	Independent variables	Correlation coefficient (r)
1	Age	0 022 NS
2	Education	0 165 NS
3	Main occupation	0 032 NS
4	Area under coconut	0 045 NS
5	Annual income	0 190 NS
6	Experience in coconut farming	0 175 NS
7	Exposure to information sources	0 236 *
8	Fatalism	0 153 NS
9	Irrigation index	0 054 NS
10	Social participation	0 025 NS
11	Progressiveness	-0 067 NS
12	Extension orientation	0 131 NS
13	Economic motivation	0 054 NS
14	Innovativeness	0 002 NS
15	Cosmopoliteness	0 140 NS
16	Rational orietnation	0 122 NS
17	Risk orientation	0 037 NS

* Significant at 5% level
NS Not significant

Table 16 Results of multiple linear regression analysis of the extent of adoption of indigenous practices by the farmers and the independent variables

n = 120

Variable No	Independent variables	Regression coefficient	Standard partial regression coefficient	t value
1	Age	0 152	0 146	0 987 NS
2	Education	4 147	0 231	1 833 NS
3	Main occupation	4 758	0 114	1 121 NS
4	Area under coconut	0 216	0 217	1 342 NS
5	Annual income	0 997	0 155	1 194 NS
6	Experience in coconut farming	0 001	0 011	0 080 NS
7	Exposure to information sources	0 754	0 179	1 773 NS
8	Fatalism	1 262	0 109	1 032 NS
9	Irrigation index	0 267	0 071	0 616 NS
10	Social participation	0 058	0 013	0 096 NS
11	Progressiveness	1 581	-0 153	1 250 NS
12	Extension orientation	0 463	0 104	0 770 NS
13	Economic motivation	0 555	-0 044	-0 366 NS
14	Innovativeness	-2 331	-0 088	0 773 NS
15	Cosmopoliteness	0 946	0 130	0 857 NS
16	Rational orientation	3 035	0 095	0 877 NS
17	Risk orientation	0 529	0 156	1 297 NS

Intercept 48 49
R^2 0 202
F value 1 52
NS Not significant

Probably exposure to the elder family members, neighbours etc might have influenced their adoption of indigenous practices

The independent variables such as education, annual income, experience in coconut farming and fatalism also showed higher correlation coefficients with the extent of adoption as compared to the remaining variables

It is already observed that the knowledge about indigenous practices was positively and significantly correlated with education So the high correlation coefficient between education and adoption of indigenous practices is quite natural

Age, progressiveness, economic notivation and risk orientation had negative and nonsignificant relationship with extent of adoption It implies that the more a farmer is progressive the more he is inclined to the modern technologies Same is the case with economic motivation and risk orientation

Table 16 presents the results of multiple linear regression analysis of the extent of adoption with the independent variables

The R^2 value indicates that the seventeen variables taken together explained only 20 per cent of variation in the dependent variable The F value obtained indicated that the variables together showed no significant contribution to the variation in extent of adoption

Out of 17, no variable showed any significant value in the analysis

These results might be indicating that the selection of the independent variables for inclusion in the interview schedule was not proper

4 6 Relative importance of selected independent variables in explaining the variation in the dependent variables

The multiple linear regression analysis gave the joint influence of all the selected independent variables To get the joint influence of the best set of predictors of the dependent variable step down regression analysis was done It was done by excluding one variable in each step according to the probability values

As most of the variables were already found to have no significant influence in predicting the variation in the dependent variable it was necessary to select the best step according to some criteria Thus, the t value was taken as the criteria for selection of the best set of independent variables The first step in which the t values of all the variables became above one was selected as the best step

4 6 1 Step down regression analysis of the selected independent variables with the knowledge about indigenous practices

Out of the 17 variables, the step selected according to the above criteria contained six variables viz education, main occupation, area under coconut, annual income, experience in farming and exposure to information sources The coefficient of determination R^2 was found to be 0 162 and the F value became significant at 1 per cent level of significance Out of the six variables present, two ie , education and area under coconut were found as significant (Table 17)

4 6 2 Step down regression analysis of selected independent variables with the extent of adoption of indigenous practices

Nine variables out of 17 were present in the selected step (Table 18) The variables present are education, main occupation, annual income, exposure to

Table 17 Results of step down regression analysis of the knowledge about indigenous practices by the farmers and selected independent variables

n = 120

Variable No	Independent variables	Standard partial regression coefficient	Regression coefficient	Standard error of regression coefficient	t value
2	Education	0 465	1 217	0 310	3 930**
3	Main occupation	0 145	0 887	0 554	1 601 NS
4	Area under coconut	0 259	0 038	0 016	2 294 *
5	Annual income	0 114	0 107	0 107	1 009 NS
6	Experience in coconut farming	0 239	0 000	0 000	1 917 NS
7	Exposure to information sources	0 162	0 100	0 055	1 817 NS

Intercept 3 71
R^2 0 162
F value 3 63**

** Significant at 1% level
* Significant at 5% level
NS Not significant

Table 18 Results of step down regression analysis of the extent of adoption of indigenous practices by the farmers and the selected independent variables

n = 120

Variable No	Independent variables	Standard partial regression coefficient	Regression coefficient	Standard error of regression coefficient	t value
2	Education	0 196	3 515	1 718	2 046*
3	Main occupation	0 138	5 761	3 912	1 473 NS
5	Annual income	0 154	0 993	0 604	1 644 NS
7	Exposure to information sources	0 200	0 846	0 395	2 140*
8	Fatalism	0 114	1 313	1 098	1 196 NS
11	Progressiveness	0 196	2 027	1 017	1 992*
12	Extension orientation	0 130	0 577	0 480	1 203 NS
16	Rational orientation	0 101	3 228	2 974	1 085 NS
17	Risk orientation	-0 187	0 634	0 346	1 834 NS
Intercept	49 24				
R^2	0 1799				
F value	2 68**				

** Significant at 1% level
* Significant at 5% level
NS - Not significant

information sources, fatalism, progressiveness, extension orientation, rational orientation and risk orientation The R^2 value was 0 1799 and the F value 2 68 which was significant at 1 per cent level of significance

Three variables were found as significant They were education, expo sure to information sources, and progressiveness Out of these three, progressiveness had shown negative influence

4 7 Empirical models of the study

The Fig 4 diagrammatically represents the results on the knowledge of farmers about indigenous practices

The knowledge of farmers about indigenous practices in coconut cultiva tion is depicted by the middle square The knowledge is influenced by various external and internal factors like the personal, socio-economic and psychological characteristics of the farmers These are represented by the rectangles on either side of the middle square

Education was the only variable significant in predicting the knowledge All the other variables were found non significant which is indicated with dotted lines

Results on the extent of adoption of indigenous practices by the farmers is presented in Fig 5

Here, the middle square represents the extent of adoption The personal, socio-economic and psychological characteristics are indicated in the rectangles on both sides of it

Exposure to information sources was the variable showing significant relationship with the extent of adoption The dotted lines indicate the non-significant relationship of the other variables with the extent of adoption

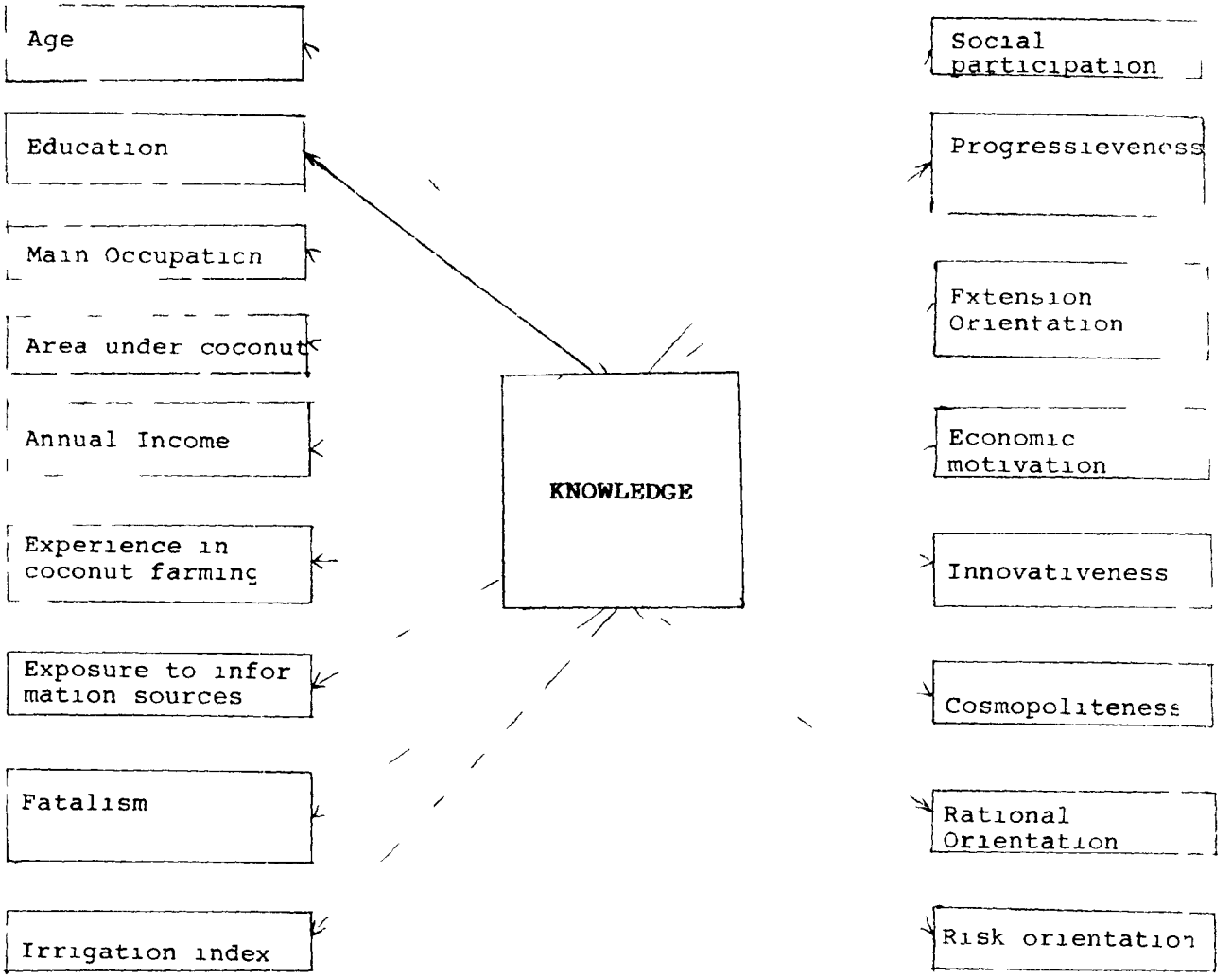


Fig. 4. Empirical model of the study showing the relationship between selected personal, socio-economic and psychological characteristic and the knowledge about indigenous practices.

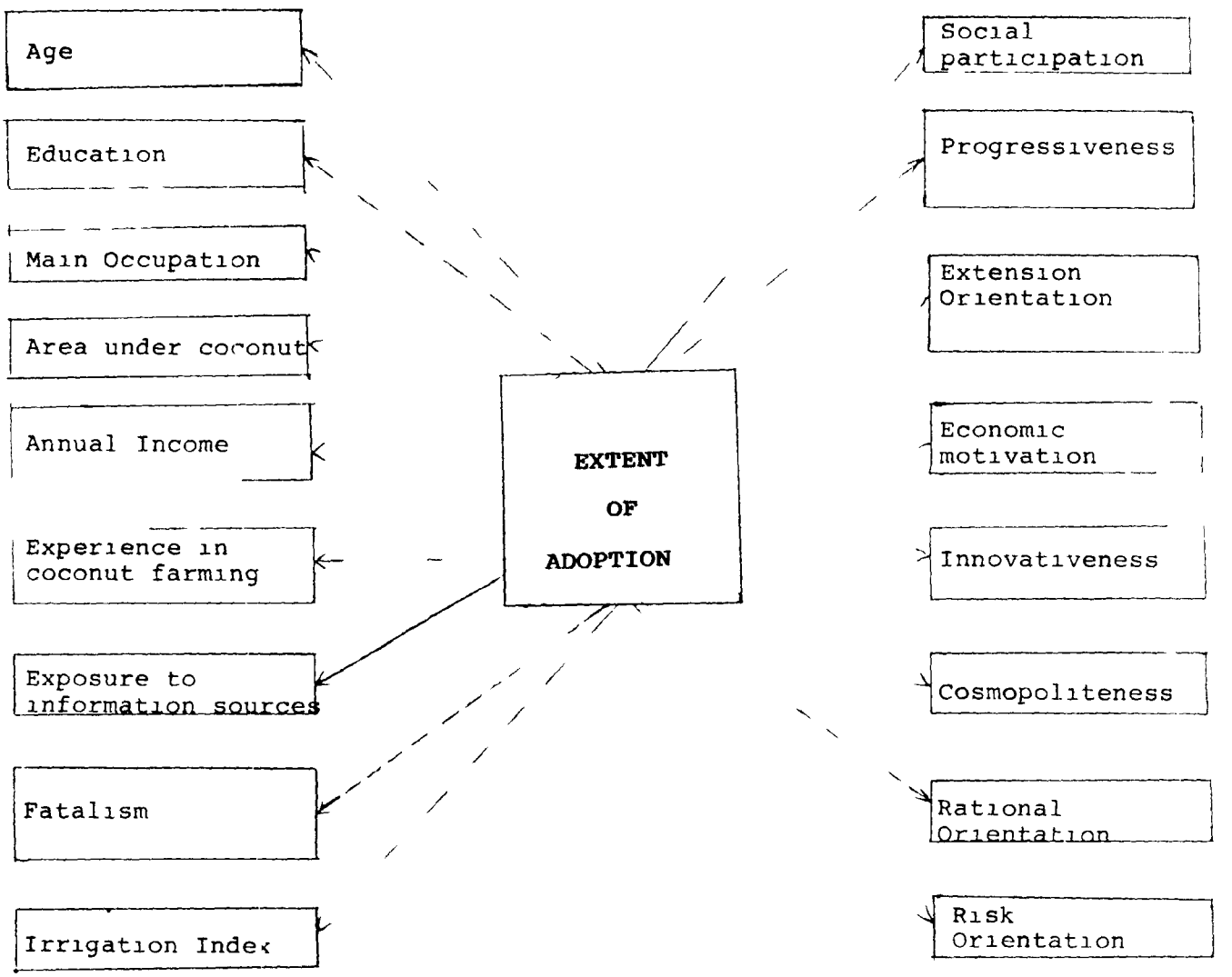


Fig 5 Empirical model of the study showing the relationship between selected personal, socio-economic and psychological characteristics and the extent of adoption of indigenous practices.

Plate 1 A leaf of coconut seedling with the thread (*Naarola*)

Plate 2 A coconut seedling in *Kattikoombu* stage

Plate 3 Shading the coconut seedlings with coconut leaves

Plate 4 Burial of Icornia in the basin

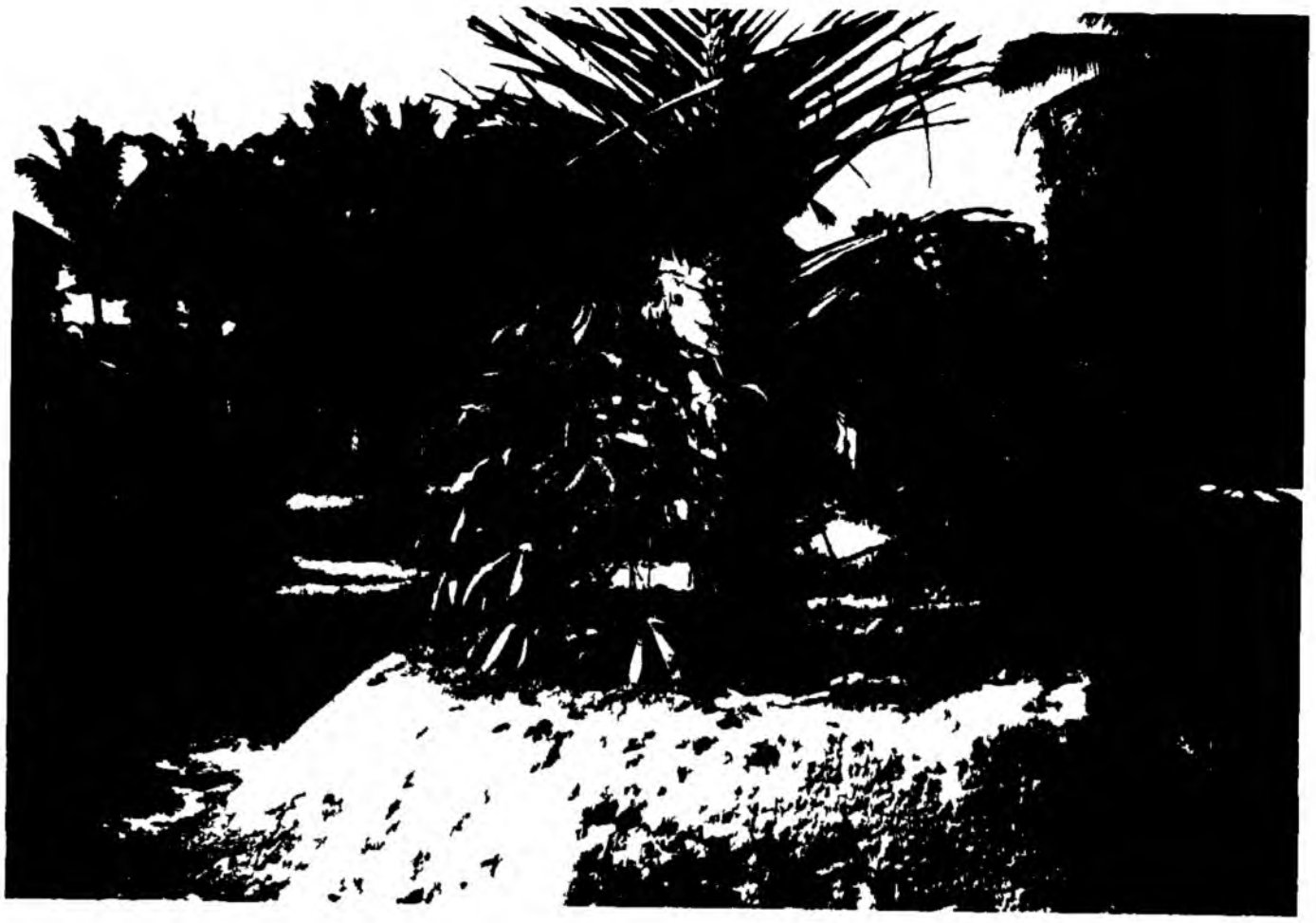


Plate 5 Soil mounds in coconut plantation

Plate 6 Blocks prepared in the plot

Plate 7 Canals in coconut plantation

Plate 8 Application of river sand in basins

Summary and Conclusion

CHAPTER-V

SUMMARY AND CONCLUSION

The overall development of Kerala depends on agriculture which has two systems traditional and the modern Innumerable research studies were being undertaken on the modern agricultural systems and technologies which are mainly exogenous Whereas, the traditional wisdom of farmers, accumulated through ex periments and experiences of generations were practically ignored till now When many of the imported/modern agricultural technologies were found to have adverse effects on the soil, plant and atmosphere and in the long run, on the ecosystem balance, our researchers started to look back for our old farm-, farmer- and eco friendly system of traditional agriculture This study is mainly an attempt at collect ing these valuable informations from the farmers and documenting them in a useful form The specific objectives of the study were as follows

5 1 Objectives

1 To identify and list out the various indigenous practices followed by the farmers

2 To assess the knowledge and evaluative perception of these practices by the farmers, researchers and extension personnel

3 To find out the extent of adoption of these practices by the farmers

4 To find out the relationship between the knowledge and extent of adoption of indigenous practices with the various socio economic personal and psychological characteristics of the farmers

5 2 Methodology

The study was conducted in Thrissur district of Kerala There are three subdivisions in the district From each subdivision one panchayat with maximum area under coconut was selected and from each of these panchayats two wards were selected at random Kodassery Punnayoor and Arimboor were the selected panchayats Thirty extension and research personnel were also selected from various parts of the district A coconut farmer formed the unit of analysis Thus altogether there were 120 farmer respondents 30 researchers and 30 extension workers

The dependent variables for the study were the knowledge about and the extent of adoption of indigenous practices by the respondents These dependent variables were quantified using measurement devices developed for the study Seventeen independent variables were selected for the study which included age education main occupation area under coconut annual income experience in coconut farming exposure to information sources fatalism irrigation index social participation, progressiveness extension orientation economic motivation innovativeness, cosmopoliteness, rational orientation and risk orientation All these independent variables were quantified with the help of available measurement procedures Evaluative perception of the respondents about the indigenous practices was also measured using a scale developed for the study

The data were collected during the months of May and June, 1995 using a pretested and structured interview schedule prepared for the purpose The statistical tools used were, correlation analysis, categorization, percentage analysis, multiple linear regression analysis and stepdown regression analysis

5 3 Findings

The salient findings of the study are summarized and presented below

1 In total, 83 indigenous practices were identified during the first stage of investigation They are listed in Appendix-II

2 Majority of farmers and extension personnel possessed medium knowledge about indigenous practices whereas, high knowledge level was expressed by 43 33 per cent of the researchers

3 'Collection of seednuts in summer' and 'bringing down the nuts with the help of ropes or coir baskets' were the most known practices when all the three categories of respondents were taken together

4 Use of rat trap made up of bamboo' was the most known practice to majority of the farmer respondents The least known practice was 'crushed onion and salt application in basins'

5 Extent of adoption of indigenous practices was medium for majority of farmers

6 Thirteen practices out of twenty were adopted by more than 70 per cent of the farmers 'Green leaf manuring was the practice adopted by most of the farmers while wick irrigation using clay pot' was the least adopted

5 4 Implications

Indigenous knowledge exists everywhere We should learn to look for it We need to systematically gather and utilize indigenous knowledge and the traditional wisdom of farmers In this regard, scientists should be encouraged to maintain a broad perspective Extensionists should treat farmers as people with valuable informations and knowledge about the local environment Hence, a two way communication system should be developed instead of the top-down approach

Collection, classification and documentation of indigenous practices are needed in other districts of the State which calls for sincere efforts on the part of agricultural scientists and the extension machinery

The field level extension personnel should be made competent in various aspects of this knowledge system so that they can provide need-based recommendations for farmers

The index developed in this study may be useful to measure the extent of adoption of farmers who are engaged in cultivation of other crops in other districts also

5 5 Suggestions for future research

The study was confined to only one district of Kerala state The indigenous practices are extremely location specific Other traditional practices may be prevailing in other districts on the some crop These, also, are to be collected and comparative studies can be made there after

A comprehensive study on the indigenous/traditional practices covering all the districts with larger sample size and including more number of variables could be under taken on various agricultural crops as well as on other allied sectors of agriculture viz animal husbandry, fisheries etc

Agricultural specialists and extension workers can take joint efforts in collecting the traditional knowledge and presenting them in useful forms like booklets, books etc Researches and location specific trials should be initiated with a view to finding out the rationality and scientific basis of these practices

Rational and low cost indigenous practices can be popularized among the farmers Also, farmers can be advised to discontinue the adoption of those indigenous practices which are scientifically irrational

Rational and compatible agricultural technologies of both indigenous/traditional and modern systems can be blended in such a way that the advantages of both can be maximized and the disadvantages minimized A sustainable, eco-friendly, low cost and profitable agricultural system can be established by a proper blending of traditional and modern agricultural systems

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* Originals not seen

Appendices

APPENDIX I

Difficulty indices and discrimination indices of the items of knowledge test

Item No in initial test	Frequencies of correct answers given by each group of respondents		Total frequencies of correct answers (n = 30)	Difficulty index (P)	Discrimination index ($E^{1/3}$)
	G_1	G_3			
1	2	3	4	5	6
1	8	6	14	46 67	0 20
2	6	4	10	33 33	0 20
* 3	10	2	12	40 00	0 80
4	4	0	4	13 33	0 40
5	2	0	2	16 67	0 20
6	0	0	0	0 00	0 00
7	2	0	2	6 67	0 20
8	7	0	7	23 00	0 70
* 9	10	5	15	50 00	0 50
10	9	6	15	50 00	0 30
*11	10	5	15	50 00	0 50
12	4	1	5	16 67	0 30
13	7	3	10	33 33	0 40
14	0	0	0	0 00	0 00
15	1	0	1	3 33	0 10
16	7	7	14	46 67	0 00
17	2	0	2	6 67	0 20
18	10	9	19	63 33	0 10
19	8	6	14	46 67	0 20

Contd

Appendix I Continued

1	2	3	4	5	6
20	4	0	4	13 33	0 40
21	10	7	17	56 67	0 30
22	10	8	18	60 00	0 20
23	7	7	14	46 67	0 00
24	4	0	4	13 33	0 40
25	9	10	19	63 33	0 10
26	4	4	8	26 67	0 00
27	1	0	1	3 33	0 10
28	10	10	20	66 67	0 00
29	10	10	20	66 67	0 00
30	10	10	20	66 67	0 00
*31	10	4	14	46 67	0 60
32	10	7	17	56 67	0 30
33	10	8	18	60 00	0 20
34	8	9	17	56 67	0 10
35	8	5	13	43 33	0 30
*36	8	3	11	36 67	0 50
37	10	10	20	66 67	0 00
38	10	10	20	66 67	0 00
*39	7	1	8	26 67	0 60
40	8	9	17	56 67	0 10
41	2	2	4	13 33	0 00

Contd

Appendix I Continued

1	2	3	4	5	6
42	10	10	20	66 67	0 00
43	0	0	0	0 00	0 00
44	4	0	4	13 33	0 40
45	10	5	15	50 00	0 50
*46	6	2	8	26 67	0 80
47	2	0	2	6 67	0 20
48	4	0	4	13 33	0 40
49	0	0	0	0 00	0 00
50	3	0	3	10 00	0 30
51	1	0	1	3 33	0 10
*52	7	2	9	30 00	0 50
53	6	7	13	43 33	0 10
54	5	3	8	26 67	0 20
55	4	1	5	16 67	0 30
56	2	0	2	6 67	0 20
57	5	0	5	16 67	0 50
58	2	0	2	6 67	0 20
59	3	2	5	16 67	0 10
*60	10	5	15	50 00	0 50
61	0	0	0	0 00	0 00
62	0	0	0	0 00	0 00
63	10	10	20	66 67	0 00

Contd

Appendix I Continued

1	2	3	4	5	6
64	4	2	8	26 67	0 20
65	1	0	1	3 33	0 10
66	0	0	0	0 00	0 00
67	1	3	4	13 33	0 20
*68	9	4	13	43 33	0 50
69	0	0	0	0 00	0 00
70	0	0	0	0 00	0 00
71	6	5	11	36 67	0 10
72	0	1	1	3 33	0 10
73	2	0	2	6 67	0 20
74	9	9	18	60 00	0 00
75	9	9	18	60 00	0 00
76	0	2	2	6 67	0 20
*77	7	2	9	30 00	0 50
78	0	0	0	0 00	0 00
79	3	4	7	23 33	0 10
80	8	6	14	46 67	0 20
*81	9	3	12	40 00	0 60
82	0	0	0	0 00	0 00
83	8	7	15	50 00	0 10

APPENDIX II

The indigenous practices followed by the farmers in coconut farming

I SELECTION OF MOTHER PALMS AND SEEDNUTS

i) Mother palms with

1 age between 35 40 years

2 25-30 or more nuts per bunch

3 larger stem girth

ii) Seednuts

4 Oblong nuts with bulged middle portion

5 Nuts with less fibre and more copra content

6 Nuts from the middle of the bunch

7 Nuts from the bunch situated in the North East side of the palm

8 Nuts with larger eyes

9 Nuts collected in summer

II COLLECTION AND TREATMENT OF SEEDNUTS

10 Seednuts left to mature on mother palm

11 Brought down with the help of ropes or coir baskets

12 Let to fall on straw bed or into water

13 Shade drying followed by soaking of nuts in water for one to two months

14 Detecting the functional eye by the float of nut on water

15 Detecting the functional eye by the position of smaller stalk

III SOWING AND SELECTION OF SEEDLINGS

16 Vertical sowing

17 Sowing when coconut water content reduces to half

18 Sowing in slanting position

19 Sowing in sand

20 Selecting seedlings with a thread (*naarola*)

21 Sowing sword staged (*Katti koombu*) seedlings

22 Seedlings with collar girth of three fingers

IV TRANSPLANTING AND CARE OF SEEDLINGS

23 Transplanting in *Bharani* day of *Kumbhom*

24 Transplanting in *Karkadakavarcha*

25 Taking square pit of size 1½ *kol* x 1½ *kol* x 1½ *kol*

26 Taking circular pit of 1 *kol* radius for transplanting

27 Taking rectangular pit

28 Application of a mixture of sand, salt and ash in pit before transplanting

29 Taking *mangukuzhi* in the pit

30 Supporting the seedlings with the help of stakes and rope

31 Shading with plated coconut leaves

32 Wick irrigation using clay pot and thread (*Thiriyittu nanakkal*)

V MANURING AND INTERCULTURAL OPERATIONS FOR ADULT PALMS

33 Husk burial

34 Burial of pseudostem of banana in the pit

35 Burial of Salvinia or Icornia in the pit

36 Fresh fish application

37 Ash and cowdung application annually

38 Green leaf manuring

39 Preparation of soil mounds (*Poli koottal*)

40 Preparing blocks in the plot (*Kattayum varambum vetti vekkal*)

41 Taking pits or channels in the inter row spacing

42 Opening basins just before the onst of South West Monsoon and closing them just before the onset of North East monsoon

VI CONTROL OF DISEASES

(i) Wilt

43 Application of leaves of Strychnus (*Kanjiram*) in basins

44 Application of crushed fruits of Mahua (*Marotti*)

45 Burial of mango leaves along with cowdung or river silt

46 Crushed onion + salt application in basins

(ii) Stem bleeding

47 Cashew Nut Shell Liquid (CNSL) application on the trunk

48 Lime pasting on stem

(iii) Button shedding

49 Removal of alternate inflorescences

50 Burial of banana pseudostem

51 Ash application

52 Dried fish residue + salt application

53 Neem cake + salt application

54 Salt application

VII CONTROL OF PESTS

(i) Termite control

55 Lime application for seedlings

56 Salt + sand + ash mixture in pit

57 Planting wild variety of arrowroot (*Koova*) in the basins

58 Fenugreek seed application in the pit

59 Neem cake in the pit

(ii) Rhinocerous beetle

60 Sand + salt filling

61 Leaves of Ailanths (*Perumaram*) in cowdung pit

62 Leaves of Vitex (*Karinochi*) in cowdung pit

63 Use of beetle hooks

(iii) Rat control

64 Lime pasting on trunk

65 Wrapping of trunk with polythene or tin sheets

66 Baiting with powdered prawn + cement

67 Use of jaggery + cottom balls

68 Rat trap made up of bamboo (*Kumbom*)

69 Sprouted paddy seeds in poison

70 Poison in parboiled rice

71 Rice flour mixed with dried fish and poison

72 Glyricidia leaves in cooked rice

VIII SPECIAL CULTURAL PRACTICES

73 Lime application to avoid barren nut development

74 Toddy tapping

75 Stamping down the leaves

76 Injuring or shaking the palm

77 Splitting the leaf petiole (*Patta polikkal*)

78 Application of Mahua (*marotti*) seed cakes in basins

79 Application of river sand during summer

80 Burial of pieces of Pentanus (*kaitha*) in basins

81 Burning coconut residues in the basin

82 Tieing coconut husk to trunk to aid climbing

83 Burning the crown of unproductive palms

APPENDIX-III

INTERVIEW SCHEDULE

INDIGENOUS PRACTICES IN COCONUT FARMING IN THRISSUR DISTRICT

DATE

PANCHAYATH

WARD

RESPONDENT NO

1 Name and address of the respondent

2 Age (in completed years)

3 Education — Illiterate/Primary/Secondary/Collegiate

4 Main occupation — Agri as main occupation/ Agri as secondary occupation

5 Area under coconut (in acres)

6 Annual income (in Rs)

On farm income

Off farm income

Total

= = = = =

7 Experience in coconut farming (in years)

8 Exposure to information sources

Sl No	Information sources	Frequency of exposure		
		Never	Occasionally	Regularly
1	Agricultural Officer			
2	Agricultural Assistant			
3	Progressive farmer			
4	Family members			
5	Neighbours			
6	Print media			
7	Radio			
8	TV			
9	Seminars			

9 Fatalism

Please indicate your agreement with the following statements on the respective column

Sl No	Statements	SA	A	DA	SDA
1	Those who say that they have seen ghosts either distort truth or tell a lie				
2	It is better to disbelieve in what is not proved or tested it is to be relied on				
3	A basic human tragedy is that man proposes and God disposes				
4	*Mantras* have far-reaching effects If one can chant and recite accurately on right occasions, one can produce miraculous effects				
5	Every moment in man's life has already been settled and determined by his fate				
	Total				

10 Irrigation index

Sl No	Source of irrigation	Period of water availability			Area irrigated (acres)
		Through-out the year	Partial availa bility	Never	
1	Tank				
2	Well				
3	Canal				
4	River				
5	Others (specify)				

11 Social participation

Sl No	Organisations	Nature of membership		Regularity in attending activities		
		Member	Office bearer	Regularly	Occasionally	Never
1	Panchayath Committee					
2	Co-operatives					
3	Group management committee					
4	Farmers' organizations					
5	Others (specify)					

12 Progressiveness

Please indicate your agreement with the following statements

Sl No	Statement	A	UD	DA
1	Girls should be educated			
2	Caste system is of no more utility under present condition and therefore its relative barriers and restrictions should be done away with			
3	Child birth is a human affair and not God given Therefore, should be under the control of man			

13 Extension orientation

a) Extension contact

Sl No	Category of personnel	Frequency of contact		
		Regularly 2	Occasionally 1	Never 0
1	Assistant Director of Agriculture			
2	Agricultural Officer			
3	Agricultural Assistant			
	Total			

b) Extension participation

Sl No	Activities	Attended whenever conducted	Occasionally attended	Never attended
		2	1	0
1	Study tours			
2	Seminars			
3	Farm fair			
4	Group farming meetings			
5	Demonstrations			
6	Others (specify)			
	Total			

14 Economic motivation

Indicate whether you agree or disagree with the following statements

Sl No	Statements	A	DA
1	A farmer should work towards large yield and economic yield		
2	The most successful farmer is one who makes the most profit		
3	The farmer should try any new farming idea which may earn him more money		
4	A farmer should grow cash crops to increase monitory profits in comparison to growing of food crops for home consumption		
5	It is difficult for the farmers' children to make good start unless he provides them with economic assistance		
6	A farmer must each his living but the most important thing in life cannot be defined in economic terms		

15 Innovativeness

Q When would you prefer to adopt an improved practice in farming?

1 As soon as it is brought to my knowledge

2 After I have seen some other farmers using it successfully

3 Prefer to wait and take my own time

16 Cosmopoliteness

a) Frequency of visiting the nearest town

Twice or more times a week/once in a week/once in a fortnight/ once in a month/very rarely/never

b) Purpose of visit

All visits relating to agriculture/some relating to agriculture/ personal or domestic matters/entertainment/any other purpose (specify)

17 Rational orientation

Q What do you feel about the increased income and improvement in life?

They may be due to

a) Beliefs in stars and not in scientific recommendations

b) Beliefs in stars and scientific recommendations

c) Beliefs only in scientific recommendations

18 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 a 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					

20 Extent of adoption of indigenous practices

Sl No	Practices	Adoption		Years of adoption	Area of adoption (acres)
		Yes	No		
1	Selecting seednuts with less fibre and more copra content				
2	Seednuts left to mature on mother palms				
3	Sowing seednuts in sand				
4	Selection of seedlings with collar girth of three fingers				
5	Application of a mixture of sand, salt and ash in pit before transplanting				
6	Shading the seedlings with coconut leaves				
7	*Thiriyittu nanakkal* (wick irrigation using clay pot and cotton thread)				
8	Burial of Salvinia/Icornia in basins				
9	Use of fresh fish as manure				
10	Green leaf manuring				
11	*Poli koottal* (taking soil mounds in plot)				
12	*Kattayum varambum* (preparing blocks in plot)				
13	Salt application				
14	Salt and ash application in pit for termite control				
15	Sand + salt filling in leaf axils				
16	Use of beetle hooks				
17	*Kumbom* (rat trap made up of bamboo)				
18	Toddy tapping				
19	*Patta polikkal* (splitting the leaf petiole after cutting leaves)				
20	Application of river sand during summer				

19 Knowledge about indigenous practices

Indicate your response with a mark in the appropriate column

Sl No	Practices	Knowledge	
		Yes	No
1	Selection of mother palms with larger stem girth		
2	Collection of seednuts in summer		
3	Bringing down the seednuts with the help of ropes or coir baskets		
4	Shading the seedlings with coconut leaves		
5	Fresh fish application		
6	*Poli koottal* (Preparing soil mounds in the plot)		
7	Crushed onion + salt application for wilt control		
8	Dried fish + salt application for button shedding		
9	Sand + salt filling in leaf axils		
10	Use of *Kumbom* (Bamboo made rat trap)		
11	*Patta polikkal* (Splitting the leaf petiole after cutting the leaves)		
12	Burning coconut residues in the basins		

21 How do you perceive indigenous practices?

Indicate your response with a mark in the appropriate column against each dimension

Sl No	Dimension	High	Medium	Low
1	Simplicity			
2	Profitability			
3	Efficiency			
4	Sustainability			
5	Input availability			
6	Flexibility			

INDIGENOUS PRACTICES IN COCONUT FARMING IN THRISSUR DISTRICT

By

MANJU, S. P.

ABSTRACT OF THE THESIS

submitted in partial fulfilment of the
requirement for the degree

Master of Science in Agriculture

Faculty of Agriculture
Kerala Agricultural University

DEPARTMENT OF AGRICULTURAL EXTENSION

COLLEGE OF HORTICULTURE

VELLANIKKARA THRISSUR

Kerala

1996

ABSTRACT

The study was carried out in Thrissur district of Kerala on the indigenous practices followed in coconut cultivation

The study aimed at identifying the indigenous practices, analysing the knowledge about, extent of adoption and evaluation perception of these practices in coconut farming

The respondents consisted of 120 farmer respondents selected from three panchayats of the district, 30 extension personnel and 30 research personnel from the district Sample selection was carried out using multistage sampling procedure

The dependent variables of the study were, the knowledge about and the extent of adoption of selected indigenous practices by farmers which were quantified using measurement devices developed for the study

The independent variables included the personal, socio economic and psychological characteristics of farmers

In total, 83 indigenous practices were identified out of which, 'collection of seednuts in summer' and 'bringing down the nuts with the help of ropes or coir baskets' were the most known practices, while, the least known was crushed onion + salt application in basins' 'Green leaf manuring was the practice adopted by most of the farmers whereas, 'wick irrigation using clay pot was the least adopted Overall evaluative perception was medium for all the three categories of respondents

'Education was the single variable which showed a significant positive correlation with knowledge whereas, 'exposure to information sources was the only one variable exhibiting a significant positive relationship with the extent of adoption of indigenous practices