A STUDY OF THE APPLICATION OF INFORMATION TECHNOLOGY IN TRIBAL MEDICINE IN KERALA WITH REGARD TO FOREST MEDICINAL PLANTS

Thesis submitted to the University of Calicut
for the Degree of Doctor of Philosophy
in Library and Information Science

By

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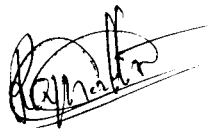
CERTIFICATE

This is to certify that this thesis is an authentic record of the bonafide research work carried out by **Smt. Asha B.**, under my supervision and guidance and that neither this thesis nor any part of it has previously formed the basis for the award of any Degree or Diploma.



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DECLARATION

I, Asha. B., do hereby declare that this thesis titled "**A Study of the Application of Information Technology in Tribal Medicine in Kerala with regard to Forest Medicinal Plants**" has not been previously formed the basis for the award of any Degree, Diploma or recognition.

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Asha

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CHAPTER I

INTRODUCTION

1.1 Information Technology (IT)

The world today is in transition from industrial age to information age. The Information Technology (IT) revolution is making a tremendous impact on the society by relentless technology innovation, massive growth in computer power, world wide net works and ever growing electronic factories (Pathak and Tripathi, 1998). It has taken a new turn in order to make the human life not only informative, but also easier and comfortable. Owing to the untired efforts of the scientists and technologists, several new technologies have been introduced, creating havoc in information acquisition, processing, and retrieval through a combination of computer and satellite based technologies in particular. Such technologies interestingly seem to have not fixed any parameter in respect to their level of operation (Panda and Gautham, 1999).

Information technology represents an assemblage of technologies. These technologies are the computer ability to store and process information, the communication technology, which represents transmitting information to location where it may be needed (Gopinath, 1985).

Right from ordering a pizza with a restaurant far from the home, till the saving of a precious human life from possible cardiologic arrest in an operation theatre, such technologies seem to have proved their capabilities beyond human imagination. Today computers are no more restricted to the corporate or elite class. It is not very costly and everybody can access it. Now the word computer is on everybody's lips, computers are now in the hands of layman.

1.1.1 Importance of IT

Information Technology has penetrated so much into every discipline that the management of information and knowledge has been more efficient, cost effective and almost at real time. The phenomenal expansion of the world wide web and the internet in every nook and corner of the world has made access to the internet from anywhere in the world smooth, fast and efficient. Websites have been created by several millions of specialized institutions on the world wide web thereby making searching and browsing the net an integral part of the new professionals daily routine (Menon, 2000).

All countries in the world are attempting to formulate their own strategies to make use of IT as a tool for progress and overall development of the country and thereby providing better quality of life to their citizens. There is a great potentiality for the third world countries to take advantage of the information technology as a whole for their overall development. Application of IT is not just confined to the

hardware, software, importing or exporting software packages. It can be effectively applied as a tool for the development of the society as a whole.

1.1.2 IT and development

Even though the developed countries have already tapped the potentialities of IT for the development of the whole society, in developing countries like India the benefits of IT are enjoyed by some multinational companies and computer professionals only. The application of IT is just confined to hardware, software, importing, exporting of software packages. But it can be effectively used as a tool for the development of the society as a whole.

Information Technology includes hardware and software, telecommunication devices and networks besides brainware and orgware. Brainware means theories, strategies and policies in the development and social application of IT and orgware concerned with the organizational and management aspect of IT (Mathew, 1985). The above aspect of Information Technology requires the social application of IT, which has more relevance in the modern context.

IT can be used as an effective tool to meet the developmental needs of the society. But till now, there is a tendency among the IT experts to delimit IT application in the traditional areas like office automation, industrial design, information communication sectors, etc. There is an urgent need to re-design the traditional concepts of Information Technology for achieving social development. For this

purpose IT application has to be extended to the non-conventional areas like agriculture, traditional health care, education, etc. IT application on a social aspect will have much relevance in the present context. But however no major works have been conducted in these fields. The present study is an attempt to explore the potentialities of IT application in developing and modernizing the tribal medicine practices in Kerala based on the forest medicinal plants with an aim of wider application of this system of medicine to the mankind as a whole.

1.1.3 IT and medicine

Computers are now widely used in modern medicine and medical research in improving the overall health care system. Consequent on the wide application of the IT in the entire aspects of modern medicine a new branch of study namely Medical Informatics has emerged (Collen, 1995). Experts in different parts of the world are fastly developing the theoretical, methodological, operational and applicational aspects of the IT in health care and in modern medical services.

1.1.4 Traditional medicine

Traditional medicine or ethno medicine is a heterogen ous term referring to a broad range of ancient and natural health care practices, which was dominant until the applications of modern scientific methods in the beginning of the nineteenth century, (Pushpangadan, 1999). Traditional medicine might also be considered as a social

amalgamation of dynamic medical know how and ancestral experience (WHO, 1978). Indian traditional systems of medicine include Ayurvedic, Unani, Sidha, Naturopathy.

There are many reasons for the promotion of traditional medicine. Firstly, traditional medicines have intrinsic qualities. So it need to be evaluated, given due recognition and developed so as to improve its efficiency, safety and availability and wider application at low cost. They are particularly effective in solving certain cultural health problems. Secondly, traditional medicine has a holistic approach. It views the man in his totality within a wide ecological spectrum, and of emphasizing the view point that ill health or disease is brought about by an imbalance or disequilibrium, of man in his total ecological system and only by the causative agent and pathogenic evolution. Thirdly traditional medicine is one of the surest means to achieve total health care coverage of the whole population using acceptable safe, economically feasible method (WHO, 1978).

1.1.5 Tribal medicine

Tribal medicine can be considered as a part of the traditional medicine, which is mainly practiced by the tribals settled in the forest area. This system is mainly confined to the medicinal plants available from the forest. The practitioners possess rich and valuable knowledge about the medicinal properties of these plants. The drug 'Jeevani' is developed from the plant 'Arogyapacha' (Trichopus zeylanicus) on the basis of the medicinal knowledge possessed by the 'Kani' tribes in

Thiruvananthapuram district of Kerala. Many such medicinal knowledge of the tribals are getting scientifically validated in this manner.

1.1.6 Medicinal plants

India is rich in medicinal plant diversity and has a special position in the world today. Because it is one of the few countries that is capable of producing most of the important plants used both in modern as well as traditional system of medicine – a result of its vast area with wide variation in climate, soil, attitude and latitude (Lambert, 1997). Majority of India's medicinal plants are found in the tropical zone, mostly in the forests of the Western and Eastern Ghats.

The tropical evergreen forest of Kerala is noted for its rich presence of valuable medicinal plants and herbs. The tribals in these forest areas are able to tackle their health problems mainly with the help of these forest medicinal plants and herbs available in abundance from their surroundings. This medicinal knowledge of the tribals has served as the basis for the preparation of many new drugs in the modern medicine.

1.2 Need and significance of the study

Kerala has a rich and valuable collection of forest medicinal plants and a number of tribal practitioners possessing a lot of knowledge about the curative aspects of these medicinal plants. This potential natural resource of Kerala has not been properly utilized so far. If this natural resource is properly utilized, it can solve many

of the social development problems of Kerala. But such studies in this direction have not been made so far.

Today one can see that many of the tribal knowledges of medicine are getting scientifically validated through research and development. As in the case of 'Arogyapacha', the traditional knowledge of 'Chackarakolly' – a plant effective to control blood sugar was scientifically proved after successful tests of trials at Council of Scientific and Industrial Research (CSIR) and Sri Chitra Thirunal Institute of Medical Science and Technology [SCTIMST], (Mukundan, 1999). Tests conducted at Regional Research Laboratories had shown that 'Neeruvatti/Chembravalli' (a plant used by the Kani tribals) was capable of reducing blood sugar level.

There is a global clamour for herbalism today. People are fed up with the ever-increasing price and dangerous side effects of the modern allopathic medicines. This factor together with the scientific validations of many tribal knowledge of medicine has created a greater awareness in Kerala towards tribal medicines. The people have realized the intrinsic value, safer and economically feasible aspects and curative efficacies of tribal medicine. So the study about the tribal medicine assumes much relevance in the context of the 'health for all' concept of the WHO.

The tribal medicine system in Kerala is still in its primitive form and follows the ancient system and practices. At the same time other traditional systems in India like Ayurveda, Sidha, Unani, etc., slowly but steadily adopted modern scientific and

technological methods of treatment and earned much acceptance. But the tribal medicine showed reluctance to accept any modern scientific methods of treatment and kept in traditional forms.

The gems of knowledge of tribal medicine are not recorded anywhere. They are handed down the generation by word of mouth. Even these words are accessible only to a selected few, very often to a chosen, most loved and dedicated descendent. Usually practitioner is reluctant to transfer his knowledge of medicine because he knows that the social recognition and influence that he enjoys from the society is because of his knowledge in medicine. So he keeps the knowledge as a private treasure. Such secret knowledge has inbuilt dangers of extinction. The tribal medical practitioner could die incommunicado without being able to transfer his knowledge to the younger generation. This leads to the decrease in the number of knowledgeable tribal medical practitioners and finally to the extinction of the light of knowledge.

Today a cursory glance at the tribal medicine reveals the signs of their erosion. The younger generation shows disinclination to initiate the profession. But loss of this indigenous system will be a loss to civilization and heritage. "Medicinal practices among the tribesmen are not just limited to the curative aspects but are integrated with many facets of their life" (Burman Roy, 2000).

The tribal medical system, which has evolved through centuries of observation, has time-tested remedies for many diseases. Now the tribal medicine or ethno medicine has become a treasure hunting ground for other medical systems and multinational drug firms. Professionals of modern medicine approach the tribal healers to collect the secret of their curing recipes. The tribal traditional knowledge is usurped and the intellectual property of the tribes is alienated. The tribal's right over their knowledge on the medicinal plants and herbs should be safe guarded. Preserving and protecting the intellectual property right from the piracy would provide economic and social benefits to the tribals as well as the state of Kerala. Further research and analysis of such knowledge of medicine is imperative for the wider application of the efficacious valuable medicine.

The immobility of the Tribal medical system to adapt to the changing societal needs and the technological advancement is a major handicap and this system challenges even the very existence of the system. This light of knowledge which has survived through long years of experience and possessing valuable knowledge about the treatments of many diseases of the present world will become extinct unless efforts has been made to preserve it. Modern scientific and technological advancement has to be applied in tribal medicine for making it beneficial to the whole mankind. The present study is a pioneering attempt towards this end.

1.3. Statement of the problem

The present study is stated as "A Study of the Application of Information Technology in Tribal Medicine in Kerala with regard to Forest Medicinal Plants".

1.4. Definition of key terms

1.4.1. Study

The word "Study" means the activity of gaining knowledge of a particular subject. (Oxford advanced learner's dictionary of current English, 5th ed., 1996).

1.4.2 Application

The word 'Application' means the action or an instance of putting a theory, discovery, etc., to practical use (Oxford advanced learner's dictionary of current English, 5th ed., 1996).

1.4.3 Information Technology (IT)

Several definitions of information technology covering its various aspects are available.

UNESCO defines Information technology as scientific, technological and engineering disciplines and the management techniques used in information handling and processing, their applications; computers and their interaction with men and machines and associated social, economic and cultural matters (Varalekshmi, 1992).

According to the Webster's new world encyclopedia (1992), Information Technology is the collective term for the various technologies involved in the processing and transmission of information. They include computing, tele communication and microelectronics.

According to the US report, IT means the collection, storage, processing, dissemination and use of information. It is not confined to hardware and software, but acknowledges the importance of man and the goals he sets for this technology, the values employed in making these choices, the assessment criteria used to decide whether he is controlling the technology and is being enriched by it (Chartrant and Morentz, 1979).

Teague (1994) defined IT as the conversion of technologies that are useful and profitable to their own right to form together a powerful new approach to information storage, transfer and retrieval. These are the technologies of computers, telecommunications and micro graphics with microelectronics as the facilitators (Patel and Kooganuramath, 1994). Even though several definitions of IT are available, the present study is mainly based on the definition given by UNESCO.

1.4.4 Tribal Medicine

Majumdar (1961) considered a tribe as "a group speaking a common language and inhabiting a common territory". He further describes them as a "collection of families or groups of families bearing a common name, members of which occupy the

same territory, speak the same language and observe certain taboos.... and have developed a well-assessed system of reciprocity and mutuality of obligations".

According to Dube, (1977) most popular definitions..... tended to see in the tribes some, if not all, of the following characteristics: (1) their roots in the soil date back to a very early period; if they are not the original inhabitants, they are at least some of the earliest inhabitants of the land; (2) they live in the relative isolation of the hills and the forests; (3) their sense of history is shallow for, among them the remembered history of five to six generations tends to get merged in mythology; (4) they have a low level of techno-economic development; (5) in terms of their cultural ethos, language, institutions, beliefs and customs, they stand out from other sections of society and (6) If they are not egalitarian, they are at least non- hierarchic and undifferentiated.

In 1982, the World Bank in its operational manual statement defined 'tribal people' as "those ethnic groups typically with stable low energy sustained-yield economic systems, as exemplified by hunter-gatherers, shifting or semi-permanent farmers, or fishermen", and exhibiting varying degrees of characteristics such as geographical isolation, un acculturated or only partially acculturated into the social norms of the dominant society, non-monetised or only partially monetised, producing largely for subsistence and independent of the national system-ethnically different from the national society-non literate and without a written language, linguistically different from the wider society, identifying closely with one particular territory,

having an economic life style largely dependent on the public natural environment, possessing indigenous leadership but little or no national representation etc. They generally have loose tenure over their traditional lands, which may not be accepted as legally binding by the dominant society. Thus they have weak enforcement capabilities against encroachers even when tribal areas have been delineated. (Encyclopaedia of Dravidian Tribes. V. I, 1996)

According to the McGraw Hill Encyclopedia of Science and Technology, (1997) the term 'Medicine' has two general meanings. The first indicates any material, notably in the drug category, which is given to prevent, alleviate beneficially alter, or stop a disease process. On the second and broader sense, medicine denotes the field of science devoted to healing.

A tribal medicine or folk system of medicine is a set of dynamic medicinal practices, based on the principles of trial and error, and on empirical evidence, which has evolved over a period of time- given a set of supports necessary for its growth and development within a unique socio-cultural and physical- environment (Johari and Karki, 1999).

1.4.5 Kerala

Geographically Kerala is located in a narrow strip of land in the southwest corner of India. It stretches from Kasaragod in the North into Thiruvananthapuram in the South (about 600km) and from the Western Ghats in the East to the Arabian Sea in the

West (about 120 km at the widest point). Kerala is a small state comprising of only 1.03 percent of the total area of India. (The Encyclopedia District Gazetteers of India, 1997).

1.4.6 Forest

A Plant community consisting predominantly of trees and other woody vegetation, growing closely together is a forest. (Mc Graw Hill Encyclopaedia of Science and Technology, 1997).

1.4.7 Medicinal Plants

According to Oxford advanced learner's dictionary of current English, medicinal denotes "having healing properties". Plant is an organism that belongs to the Kingdom Plantae (Plant Kingdom) in biological classification. The term is also loosely used to indicate any organism that is not an animal. (Mc Graw Hill Encyclopaedia of Science and Technology, 1997).

So medicinal plants denotes those plants having healing properties.

1.5 Objectives of the Study

1. To study the present status of the tribal medicine practices in Kerala.
2. To study the nature of collection of forest medicinal plants and the methods of preparation of medicines.
3. To examine the potentiality of information technology applications in tribal medicine for modernizing the tribal medical system for a wider applicability.

1.6 Hypotheses of the study

1. Tribal medicine practices in Kerala is getting general acceptance and is maintaining a steady growth.
2. Tribal medicines have a greater relevance in the modern context.
3. Information Technology can be applied in tribal medicine for its modernization with a view of achieving wider recognition even at the global level.

1.7 Methodology in brief

The general nature of the present study was empirical. Data has been generated from the field study. Since the population of the study was large, sample study was conducted. Earnest effort has been made to take a representative sample from the population.

After considering the relevant characteristics of the population, the geographical area consisting of the three revenue districts of Kerala viz., Wayanad, Idukki and Thiruvanathapuram were selected for the study purpose. After a complete enumeration of this study area, 30 tribal medical practitioners were identified. 100 clients (users) of these practitioners were selected in two different ways. Half of them (50 users) were selected by circular systematic sampling from the address record of the users maintained by some practitioners (10 in number) and the other half (50 users) from the clients of the remaining practitioners (20 in number) on spot selection by a Simple Random Sample With Replacement (SRSWS) technique by interviewing the users immediately after their visit to the TMPs. The researcher itself has conducted interview. Data collected from the practitioners and users were separately analysed with appropriate statistical techniques. Observations made during the field study were also interpreted with the help of relevant studies.

1.8 Limitations of the study

The present study was conducted from the point of view of an information scientist rather than that of a pharmacologist or biochemist. After considering the relevant characteristics of the population, the three districts of Kerala namely Wayanad, Idukki and Thiruvananthapuram were selected for this study. The curative efficacy of the tribal medicine has been assessed on the basis of user survey.

1.9 Organization of the Thesis

The thesis is organized into 6 chapters as detailed below.

Chapter I Introduction

This chapter contains the need and significance of the study, statement of the problem, definition of key terms, objectives and hypotheses of the study. A brief methodology is also provided.

Chapter II Tribal medicine – an overview

This includes a bird's eye view of traditional medicine and tribal medicine.

Chapter III Review of related literature

Some relevant studies in tribal medicine are given in this chapter.

Chapter IV Methodology

This chapter consists of the detailed description about the characteristics of the population of the study, the criteria adopted for selection of the study area and description about the procedures followed for selection of true representative sample.

Chapter V Analysis and interpretations

This chapter contains mainly the analysis of the data collected from the field. The observation made from the field were also analysed with the help of relevant secondary data and other relevant studies.

Chapter VI Summary, conclusions and policy implications

This chapter consist summary and conclusions made from the analysis of the data and some policy implications.

TRIBAL MEDICINE - AN OVERVIEW

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CHAPTER 2

TRIBAL MEDICINE – AN OVERVIEW

Tribal medicine is a part of Traditional medicine and is mainly practiced by the tribals in the forest. It is still in the primitive form. A study about tribal medicine will be incomplete without the background of traditional medicine. So in this chapter a brief description about traditional medicine and tribal medicine are given.

2.1 Traditional medicine

Traditional medicine has been prevalent in every country since the beginning of the civilization. According to Siegerist (1951), a medical historian "every culture had developed a system of medicine and medical history is but one aspect of the history of culture". Traditional medical systems vary from one culture to another, there are common elements connoting specific implications in them. The elements are sorcery and witchcraft, divination and herbal medicine (Joshi, 1990). According to Dubos (1969), "ancient medicine was the mother of sciences and played a large role in the integration of early cultures".

The term "traditional medicine" refers to ways of protecting and restoring health that existed before the arrival of modern medicine. As the term implies, these approaches to health belong to the traditions of each country, and have been handed down from generation to generation

(www.scidev.net/dossiers/indigenous_knowledge/ikdefs.html). Not all health practices are health traditions. There are two criteria for calling a practice a tradition. Firstly, traditions are those practices that are self-perpetuating. They are practices that are transmitted without the intervention of any agency or institution. Furthermore, they form the unwritten repertory of health practices that have been passed down the generations through word of mouth for atleast one century and continue to be passed down even today (Shankar et al, 2001).

2.1.1 Traditional medicine: a historical background

Since antiquity, the most primitive man had some rudimentary system of medicine to ameliorate pain and disease in order to lead a productive socio-economic life in the society. Over the ages his experiences led to empirical techniques and methods of healing, which in due course of time crystallized into distinct systems of medical practices.

The early therapeutic agents were mainly derived from his immediate environment and consisted of plants, animals and other naturally occurring substances (Reddy, 1986).

The ancient civilization of India, China, Greece, Arab and other countries of the world developed their systems of medicine independent of each other, but all of them were pre–dominantly plant based (Planning Commission, 2000).

Chinese medicine claims to be the world's first organized body of medical knowledge dating back to 2700 BC. Hygiene, dietics, hydrotherapy, massage, drugs, were all used by Chinese physicians. They were early pioneers of immunization.

Egyptians believed that disease was due to absorption from the intestine of harmful substances. Diseases were treated with enema, blood-letting and a wide range of drugs.

Mesopotamia was the cradle of magic and necromancy. The basic concepts of medicine were religious and taught and practiced by herb doctors, knife doctors and spell doctors. The oldest medical prescription comes to us from Mesopotamia, dating back to 2100 BC.

Greeks rejected the supernatural theory of disease. The Greeks postulated that health prevailed when the four humors, earth, air, fire and water were in equilibrium and when the balance was disturbed, disease was the result.

The Romans had the keenest sense of sanitation. About diseases, they observed that disease is due to three factors predisposing, exciting and environmental factors, a truly modern idea (Park and Park, 1991).

2.1.2 Indian context

There was a system of medicine with professional healers in India for several centuries before and after 2000 BC. Harappan culture contained the seeds of later Indian medicine. That apart, a few lines on definite nature of medicine are to be found in the earliest literature of India, the Rigveda, the data of which may mostly be referred to the later part of the 2nd millennium BC. During this period disease was believed to be mostly due to wrath of gods and effect of evil spirits and healing art was followed by prayers, several hymns and often aided by the herbal remedies and other treatments and they cured some diseases like blindness, lameness and even leprosy. In the late 5th or 6th century before Christ, the traditional Indian medical system formed and references can be found in the Hindu texts. During this period, there was a strict system of socio-religious taboos followed by controlling the contacts and dietary habits of the people. In course of time the science of medicine, which came to be known as Ayurveda was formed and a line of sages were believed to have carried the original lore of the Ayurveda in various eras, down to historical times. In the later stage, Charaka and Susruta contributed to popularise the Ayurveda in India by bringing out Sanskrit medical manuals namely, the Charaka Samhita and Susruta Samhita respectively [Reddy, 1986].

The pharmacopoeia of the Vaidya was very large and Susruta alone mentioned over 700 medical herbs. (Jolly, 1901). Surgery was also practiced, like the removal of calculi from the bladder, the replacement of bowels exposed as a result of wound,

stiching the stomach wall and the caesarean section in the case of mothers who died before giving the birth. The achievements in plastic surgery were unrivalled anywhere in the world until the 18th century [Kutumbiah, 1962]. A hospital in the true sense of the term is clearly described by Fa-hsien, the Chinese traveler who visited India at the very beginning of the 5th century AD (Beal, 1957).

Soon other systems of medicines like Sidha, Unani etc. also emerged and continued to develop with Ayurveda. These systems have actually survived the onslaught of ages primarily because of the systematic method in which the practitioners of these systems recorded their knowledge. But in contrast, tribal medicine being passed from generation to generation by virtue of word of mouth alone is actually losing its ground.

2.1.3 Definitions of traditional medicine

There are number of attempts to define traditional medicine by taking into account the concepts and practices are being gathered, analysed and evaluated by several scientific disciplines but there is no much satisfactory or comprehensive type of definition, which can cover all the aspects of traditional medicine in its true logical spirit [Reddy, 1986].

According to Reddy, " Traditional Medicine is that of whole, which includes a holistic knowledge and practices oral or written, functioned in diagnosis, prevention and curative aspects of illness and disease to promote total well-being, confined

explicitly or implicitly on practical experiences and observations or know – how techniques with or without local/regional culture having overtone of religion or not."

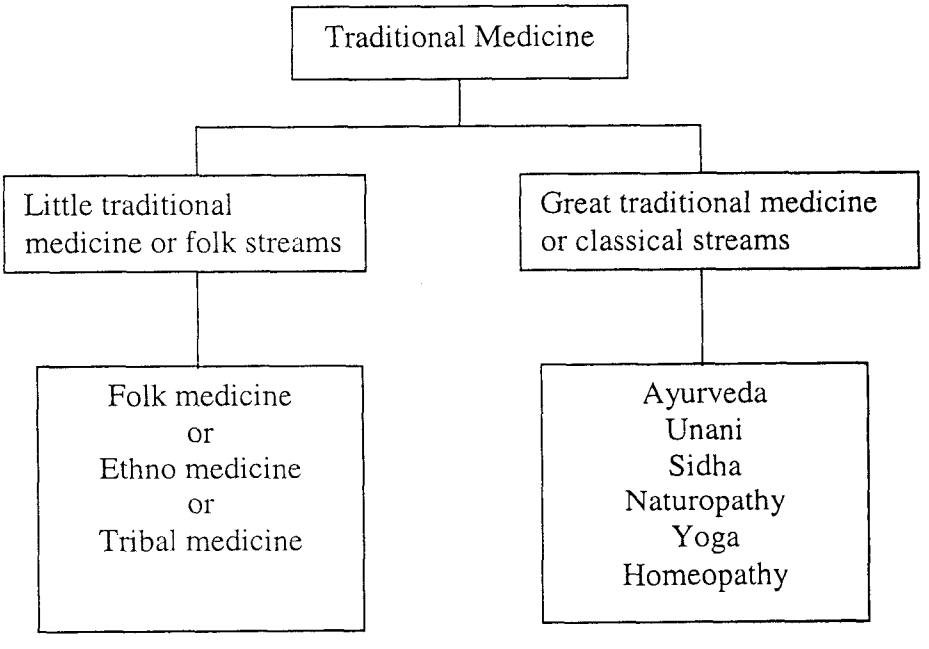
"The sum total of all the knowledge and practices, whether explicable or not, used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing" [WHO, 1978].

2.1.4 Classification of traditional medicine

The area coming under the purview of traditional medicine can be broadly classified as follows:

Figure No. 2.1

Classification of traditional medicine



According to the Task Force Report, Government of India, 'folk streams' and 'classical streams' are the two divisions of traditional medicine. Folk stream comprises mostly of the oral traditions practiced by the rural villages. The carriers of these traditions are millions of house wives, thousands of traditional birth attendants, bone setters, village practitioners, eye treatments, treatment of snake bites and the traditional village physician/herbal healers, the 'Vaidyas' or the tribal physicians. These streams of inherited traditions are together known as Local Health Traditions [LHT].

Classical stream is the second level of traditional health care system in the scientific or classical system of medicine. This comprises of the codified and organised medicinal wisdom with sophisticated theoretical foundation and philosophical explanations expressed in classical texts like 'Charaka Samhita', 'Susruta Samhita', 'Bhela Samhita' and hundreds of other treatises including some in the regional languages covering treatises of all branches of medicine and surgery, Systems like Ayurveda, Sidha, Unani, and Tibetan etc are expressions of the same [Planning Commission, 2000].

2.1.4.1 Folk stream/Little traditional medicine

a. Folk medicine

The concepts and practices in folk medicines are based upon the humoral theories, cosmological speculations, magic in learned/oral medicine and religion. The practice field of this medicine is midwifery, bone setting, supernatural cures of various types with main emphasis is on utilizing natural herbs, roots, plants and other natural things in a given eco–system. The knowledge of such medicinal plants and preparation of medicine are still handed down mostly in oral form to the next generation of such practitioners [Chaudhuri, 1986; Reddy, 1986].

b. Tribal Medicine/Ethno Medicine

The tribes who lived in isolation practiced their own system of medicine, which is known as tribal medicine or ethno medicine.

2.1.4.2 Classical stream/Great traditional medicine

a. Ayurvedic medicine

It is basically concerned with preserving and promoting health and longivity amongst the early settlers. In later years it developed into an entire system of medicine and was practiced scientifically as a particular approach to health care. The basic concept of total management of health and preservation and vitalisation of life was not disputed. In fact it combines in health cure system, the humoral concepts of hot food

and cold food, significance of vitamins, oral and traditional medicine suitable for physiological concepts, bacterial theory of disease with dimensions of astrology, faith and mysticism included.

Ayurveda tends to focus on the use of single herbs for most symptoms. However, the combined use of several herbs may be recommended for a particular disease. Ayurveda is based on theories more closely related to the Greco–Roman concept of the four humors – blood, phelgm, yellow bile and black bile than to the Chinese concept of yin and yang.

The Ayurvedic forces are the three doshas – Kapha (cold, moist), pitta (hot, dry) and vata (wind). These tridoshas can be subdivided and they interact with the gunas (basic psychological qualities of the mind) and other characteristic that are perceived to be relevant factors that govern life and health. These philosophic concepts apply universally to all aspects of life in a complex fashion (Aggarwall, 1998).

b. Unani medicine

In ancient Greece the system of unani medicine was developed during early Islamic period and has been brought to India with the Islamic rule during 1101–1707 A.D. Over the centuries of preservation and addition to the system as well as decades of research and crystallization of the system, it has become almost indigenous in India. Though the system was practiced by Muslim medicine men called Hakims, the system is still based on herbal medicine, different minerals and metals

like gold, silver iron, copper etc., as well as a lot of indigenous mineral abstracts like snake venum, juice extracted from liver and kidneys of monkeys, goats and other cattle and birds. Minor forest produce like honey, herbs, and fruits as well as flowers and seeds of medicinal plants are also used in the unani system of medicine [Chaudhuri, 1986].

c. Sidha medicine

It is a variant of Ayurvedic medicine, which is practiced in Tamil speaking area with more emphasis on the extensive use of minerals and metals. Specially mercurial preparation in medicine, with the sophistication of local culture and tradition. In fact, the word Sidha in Tamil is almost synonymous to word Ayurveda [Reddy, 1986].

d. Naturopathy and yoga Medicine

This could be taken as integration of folk medicine and ayurvedic medicine. The concept was popularised by Gandhiji through personal experiences and observance with natural cures. This system of health care includes indigenous medicine, dietary regulation and yogic exercise relating to the specific areas of bodies as well as external application like mud bath, sunbath, body massage as well as exercise on mental concentration. These methods have been very popular in the west and in the European countries in the last few decades (Aggarwal, 1998, Reddy, 1986).

e. Homeopathic medicine

The system is originated in Germany and later practiced and developed in Asia and European countries. India is strongly following this system of medicine. The concept of this medicine is of creating a resistance to an illness by administering small doses of specially grounded medicines in biological ritualism. The practice of homeopathic medicine in India is very much assimilates the elements of Ayurvedic and Unani medicine system, which was later institutionalised as a form of medicine [Reddy, 1986].

2.1.5 Traditional medicine in the present scenario

a. World context

Traditional medicine plays an important role in health care in both developed and developing countries. The World Health Organisation estimated that 80 percent of the populations in developing countries rely on traditional medicine, mostly plant drugs for their primary health care needs. It is estimated that over one-third of the world's population lacks regular access to affordable essential drugs. For these people modern medicine is never likely to be a realistic treatment option. In contrast, Traditional medicine is widely available and affordable, even in remote areas, and generally accessible to most people [Zhang, 2000].

Many countries have applied modern medical knowledge and methods on traditional medicine and revived it to suit the modern society. "The use of traditional medicine and medical plants in most developing countries, as a normative basis for the maintenance of good health, has been widely observed [UNESCO, 1996].

The practice of traditional medicine is widespread in China, India, Japan, Pakistan, Sri Lanka and Thailand. In China about 40 percent of the total medicinal consumption is attributed to traditional tribal medicines. In Japan, herbal medicinal preparations are more in demand than main streams pharmaceutical products. (Hoareau and Da Silva, 2001).

In Europe, some 1500 species of medicinal and aromatic plants are widely used on Albania, Bulgaria, Croatia, France, Germany, Hungary, Poland, Spain, Turkey, and the United Kingdom. The Maltese islands constitute an apt example where medicinal plants are widely used in everyday life as part of folk medicinal remedies (Lanfranco, 1992).

Country wise usage of plant-based medicine is shown in the table no. 2.1.

Table No. 2.1
Country-wise usage of plant-based medicine

Country	Percentage
Australia	48
Canada	50
USA	42
Belgium	40
France	75
India	70
Africa	80
United Kingdom	90

(Source: UNCTAD Expert Meeting Report, 2000)

b. Indian context

In India, the integration of traditional medicine into public health service system is advancing satisfactorily. In India 70% of the population uses Indian medicine, (Zhang, 2000) Ayurveda, Sidha, Unani and Yoga are now widely adopted through government policy and included in the curricula of several institution of learning including Universities, Colleges of medicine and secondary and primary schools, as well as in centers for the training of diverse type of health personnel. The Government of India has recently created a department of Indian System of Medicine (ISM) in the Ministry of Health to oversee policy and research in this area. India has over the years set up a National Institute of Homeopathy and Ayurveda. Similar institutions exist for Unani and Sidha tradition of medicine based on indigenous knowledge. There are colleges teaching ISM and training doctors all over

the country. The ISM tradition is stronger in south India where it is preferred option for many people (Sahai, 2002).

2.2. Tribal medicine

2.2.1. Introduction

The use of medicinal plants for the treatment of disease was known to the tribals many centuries ago. From time immemorial the people especially tribal people realized the curing and healing properties of the herbs and roots (Sharma, 1999). There are estimated to be around 25,000 effective plant based formulations used in folk medicine and known to rural communities all over India (Planning Commission, 2000). The tribes who live in isolation, practice their own system of medicine known as ethno medicine or tribal medicine. According to Hughes, ethno medicine is "the medical system of the primitive which have been evolved in their own cultural milieu and recognized as the methods of diagnosis and treatment which are natural or not. It includes all the body of beliefs, therapeutic practices including pharmacopoeias which they use for curing diseases, even if they attribute the cause of natural or super natural forces" (Sills, 1968).

According to Shankar (1989), "it may surprise people to learn that throughout India, in most of her folk communities, there exist living traditions of health care. These are based on the use of locally available fauna, flora and minerals. They encompass important areas of the health care like mother and childcare, treatment of common ailments, home remedies, first aid and nutrition. They also deal with specialised areas like snake poisons, dental care, broken bones, veterinary care and treatment of chronic ailments. These traditions are of extremely decentralized nature. At one extreme is the house wife with knowledge of home remedies while on the other there are the folk practitioners who deal with special areas like the village mid-wives and traditional tribal practitioners".

Soren (1997), elucidates that "tribal medical traditions exhibit an entirely autonomous character. They are community or culture specific with little overlapping between the medical practices of communities residing within the same region. They function today with thousands of traditional practitioners and have been functioning so far thousands of years. Traditional practitioners belonging to the same community interacts and shares their knowledge between themselves. However, there is very little or no information sharing between the practitioners of different communities".

Different tribal communities utilize different plants or different parts of the same plants for particular ailments. This indicates a deep knowledge about these herbs and plant as well as combination and dose of such indigenous objects for cure of different diseases (Chaudhari, 1989). Various herbal medicines utilized by many tribes have

rich ingredients of medicinal value for effective birth control, treatment of skin diseases, ear and eye infection, cough and cold and other epidermal diseases (Pati, 1991).

For minor ailments, plants available in the surrounding areas are used while for more serious ailments, there are specialist in traditional medicines. Great faith is placed in these medicines often at the expense of "hospital medicines". (Anilkumar and Vedavalli, 1999).

2.2.2 Transfer of knowledge

Tribal medicinal knowledge is passed from generation to generation by means of word of mouth. According to Mashelkar (2002), folk traditions are handed over orally from generation to generation. The folk medicine is based on traditional beliefs, norms and practices based on centuries old experiences of trials and errors, success and failures at the household level. These are passed through oral traditions and may be called "peoples health cultures, home remedies or folk remedies". Johari and Karki (1999), opines that, "the custodians of herbal folklore are generally individuals or groups of families who have inherited their knowledge through oral traditions passed down generations. This knowledge which is often regarded as a family treasure, is not accessible even to the rest of the community to which the practitioner belongs and is therefore vulnerable to destruction and loss". According to Saraswati (1987), "the

tribal knowledge of different herbal preparation is based on observations and experiment. The empirical knowledge is transmitted by word of mouth".

2.2.3 Importance of forest medicinal plants

Medicinal plants growing in forest ecosystem meet many of the health care needs and requirements of the Indian population. For example, of the 2000 drug items recorded in the Indian Materia Medica, 1800 are of plant origin - about 80% of the raw materials required in the manufacture of drugs are forest based (Lambert et al, 1997). A survey conducted by the All India co-ordinated Research project on Ethnobiology (AICRPE) recorded over 8000 species of wild plants used by the tribals and other traditional communities in India for treating various health problems (ISMH, 2001). According to the FRLHT report, the Indian system of medicine uses across the various systems, i.e., folk, sidha, unani, etc., around 8,000 species of plants. The maximum numbers of medicinal plants are utilized by the folk traditions, followed by Ayurveda, Sidha, Unani, Homeopathy, Tibetan and Modern respectively (Shankar et al, 2000). The usage of medicinal plants across medicinal system is given in the Table 2.2.1.

Table 2.2.1

Usage of medicinal plants across medicinal system

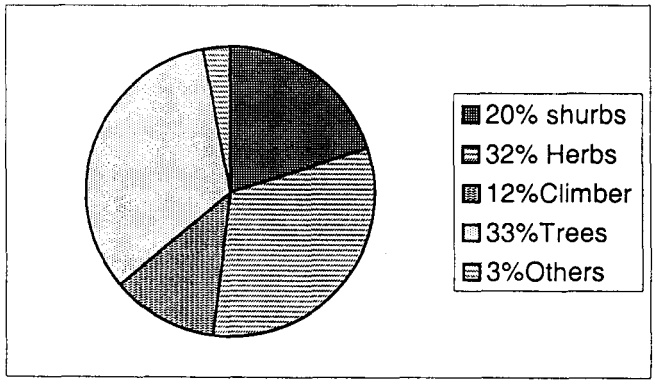
Medicinal Systems	Ayurveda	Folk	Homeopathy	Modern	Sidha	Tibetan	Unani
Ayurveda	1769	731	164	55	743	271	653
Folk	731	4671	147	56	635	201	486
Homeopathy	164	147	482	60	142	70	155
Modern	55	56	60	105	41	17	50
Sidha	743	635	142	41	1121	227	486
Tibetan	271	201	70	17	227	279	224
Unani	653	486	155	50	486	224	751

(Source: FRLHT Report, 1998)

Among the medicinal plants used, one-third is trees and equal portions are shurbs and the remaining one-third herbs, grasses and climbers. A very small proportion of the medicinal plants are lower plants like lichen, ferns, algae etc. Majority of the medicinal plants are higher flowering plants [Planning Commission, 2000]. All these are shown in the Figure 2.2.

Figure 2.2

Pie diagram showing distribution of medicinal plants by habits



(Source: Report of the taskforce, on conservation and sustainable use of medicinal plants, 2000)

Herbal medicine have been defined by several WHO guidelines that they include crude plant materials, such as leaves, flowers, fruit, seed, stem, wood, bark, roots, rhizomes or other plant parts, which may be entire, fragmented or powdered. (Z hang 2000).

Medicinal plants can act as a harbinger of large foreign revenues. The global herbal market and industry have been growing rapidly in recent years. Today, medicinal plants enjoy great potential for export. It must be noted that the vast majority of plant resources originate from developing countries. International market of medicinal plants is over US $ 60 billion per year, which is growing at the rate of 7 percent. India at present exports herbal material and medicines to the tune of Rupees 6446.3 crores only, which can be raised by Rs. 3000 crores by 2005. China and India are two great producers of medicinal plants having more than 40 percent of

global biodiversity. China besides meeting its domestic requirements is earning US $ 5 billion per year from herbal trade (Planning Commission, 2000).

India especially Kerala has a rich biodiversity. But foreign nations have already grabbed the patent right of many of our medicinal plants. The right of 'chakarakolly' – a traditional medicine of the 'Kani' tribals in Thiruvananthapuram districts of Kerala, was grabbed by Dai Nippon Sugar Company of Tokyo. This patent was denied after it underwent successful tests of trials at the Council of Scientific and Industrial Research (CSIR) and Sri Chithra Thirunal Institute of Medical Science and Technology (SCTIMST), Thiruvananthapuram. Adequate legal measure has to be taken to protect such bio-diversity piracies and related problems, which might arise in future.

REVIEW OF RELATED LITERATURE

Asha B. “A study of the application of information technology in tribal medicine in Kerala with regard to forest medicinal plants ” Thesis. Department of Library and Information Science ,University of Calicut, 2002

CHAPTER III

REVIEW OF RELATED LITERATURE

The review of literature for the present study revealed that there is no literature in the area of Application of Information Technology on Tribal Medicine. The studies about the Tribal Medicine itself is rare. Majority of the existing studies are about the folk/ethno/Tribal medicine practices of some particular tribal communities in India.

Panigrahi (1991) studied the types of prevalent traditional folk medicine and their major usage in different diseases among the Gonds of Orissa. He also analyzed the extent of the use of folk medicine for basic health care by the community and the necessity of tapping such freely available resources.

Boḇan (1998) analysed the medical practices and healing rituals existing in two tribal communities- Muthuvans and the Mannans of Idukki district in Kerala in order to evaluate the changes occurring in the traditional medical system as a result of the influence of modern medicine. He attempted to understand the challenges of medical pluralism upon ethnomedicine and the ways in which this system manages to survive. He found that the introduction of modern medicine did not affect completely, the ethnomedical practices.

Maheshwari (1999) conducted ethno-medico-botanical surveys of two of the most primitive tribes of Madhya Pradesh – the Baigas and the Sahariyas. The study found that while the government has provided a number of health facilities in tribal areas of the state the two groups continue to depend on their medicine men.

Kurian, et al (1980) has attempted to make an analysis on ethno medicine by collecting, identifying and classifying the type of traditional medicines and their major usage in reference to ailments in the community of Nomadic vaidus of Maharashtra.

Sharma (1999) has made an attempt to identify the medicinal plant species and their curative properties in the geographical area of Hatma Village, Mandar, Ranchi.

Nair (1985) in his study on "Tribal health and medicine in Kerala" examined how a tribal society meets the health needs of its members, with its own medicines and healers and collected the details of various tribal medical practices and listed the names of herbal, mineral and animal matters used in their curing techniques. He also highlighted the comparative analysis of health and medicine of selected tribal societies and showed how it concomitantly varies.

Palekar (1999) studied the ethno medical traditions of the Thakur tribals of Karjat Tribal block, Maharastra, and presented a categorization of traditional medical practitioners in the block; their fields of expertise; the medicines they use; the methodology they follow in determining the medicinal uses of plant/animal species and some of the customs they follow when collecting medicinal plants.

Singh and Anwar Ali (1999) conducted studies on medicinal plants and ethno medicines of Garhwal and Kumaon regions of Uttar Pradesh. They surveyed the existing medicinal plants of the area including those used in Unani system of medicine and their present status. They highlighted the threatened and endangered medicinal species and folk drugs either commercially utilized by traders and pharmaceuticals or locally exploited by the natives and recorded detailed information on ethno medicines of that area.

Vihari (1999) studied the use of traditional medicine by the Tarus, an aboriginal tribe inhabiting the Indo-Nepal border. This paper identified the common diseases and ailments affecting "Tharu" communities and examined the extent and use of herbal folklore and tribal medicine.

Rajan and Sethuraman (2001) presented the ethno botanical and ethno medical knowledge of the Irulars of Nilgiri. The use of plants to treat the common ailments by Irulars was summarised.

Binu (1999) undertook a research work in the forest areas of Pathanamthitta district of Kerala state and reported that 158 species of plants were being used by different tribes in Pathanamthitta for medicinal purpose and 49 percent of ethno botanical species from Pathanamthitta have medicinal properties. He also claimed that out of the 158 ethno medicinal species reported, medicinal use of 57 species are newly reported by him.

Mathur (1982) examined the existing medical facilities available in Wayanad, one of the important tribal areas of Kerala. He also analyzed the diseases and curing techniques prevalent among the tribals of Wayanad.

Jawahar (1996) attempted to study the medicinal plants and practices of Kani and Malapandaram tribes of South Kerala. He found that the medicinal knowledge of the Malapandaram has significantly eroded as a result of the lack of natural contact between the medicine man and ordinary members of the tribe due to their nomadic life style. He also argued that the settled life of Kanis had helped to preserve a major portion of the medical know-how of their ancestors.

Literature about the very relevant studies relating to medicinal plant and folk medicine was found.

Yesilda et al (1993) investigated the traditional ulitization of plants as medicine in the Taurus Mountains of Mediterranean region. They identified 69 Medicinal plants and listed them with their vernacular names, the parts used, the methods of preparing the drugs and their traditional usages.

Sali (1991) discussed the scientific credibility of traditional medicine and also listed the advantages like relative safety, easy availability etc. of traditional medicine over modern medical practices. He advocated the inclusion of traditional medicine in the national health system of Bangladesh.

Okie (1993) described how health officials joined forces with local practitioners in Kenya to combat medical problems. The author reported that The African Medical Research Foundation has trained traditional healers from isolated Kenyan villages in primary health care and family planning.

A review of some of the literature which concentrated purely on the efficacy of certain plants against particular ailments are given.

Brahman and Dash (1999) presented some of the findings of ethnobotanical studies carried out on the Kolha tribe of Keonjhar District, Orissa. They analysed the therapeutic and other folk uses of 80 species of plants and listed them in detail.

Pushpangadan et al (1998) described the secret of 'Arogyappacha' – the herb that gives very good health, stamina and vitality. This plant is used by the local 'Kani' tribes of Agastyar hills of Trivandrum district of Kerala as a health food. The authors also described how they traced the secret of this jealously guarded information.

Rajasekharan et al (1989) presented two important species of plants, Cheriya arayan (Aristolochia, Linn) and Valiya arayan (Aristolochia tagala.chan) used by the Kani tribes of Agastyar hills of Trivandrum district of Kerala against snake poison and insect bites. The study has further revealed that the above mentioned plants were widely used against various ailments by the folk medicine practitioners of Kerala.

Rajasekharan et al (1992) conducted a survey which revealed that healing art techniques of Kani's are now in an almost ruined state and the knowledge on medicinal herbs are limited to a few of the older generation. In this article, he pointed out that the 'Sudorification' (a kind of medicated steam bath) is very effective for various dermatological conditions including Psoriasis. The method of treatment and drugs used have been discussed in detail.

Bhattacharjee et al (1986) presented the ethno-botanical identity of 28 plant species which are being used by tribals of Bihar, Orissa and West Bengal namely Santal, Munda, Oraon, Birhors, Ho, etc., as single drug or in combination with other plants.

Singh and Singh (1986) have described information about contraceptive plants for females from aboriginal tribes, traditional healers, Vaidya rajas, etc., of various parts of Uttarpradesh, India. Some plants were experimentally evaluated for their contraceptive efficacy and the results were optimistic and was presented and the authors suggest that these plants can be utilized in the preparation of an indigenous contraceptive pill.

Asha et al (1992) conducted a study on the medical use of a hither-to unknown wild plant yielding a drug for chronic jaundice.

Olukoys (1993) studied the scientific basis of the use of the Nigerian plants for medicinal purpose. Ten medicinal plants used for the treatment of various microbial infections were studied and the antibacterial activity of these plants were established.

Khan et al (1984) attempted to study the medicinal efficacy of the various plants used by the 'Gond' tribals in Bhopal.

John (1984) attempted to present a selected list of 100 drugs commonly used by experienced elders of the 'Kani' tribe of the Thiruvananthapuram forest division of Kerala state with details of administration. He also made an attempt to evaluate the claims of the tribes in terms of known chemical constituents of the plants.

Some of our valuable medicinal plants have become extinct due to afforestation, overharvesting, etc. A review of some of the studies in this regard was found.

Anilkumar and Vedavalli (1996) conducted a case study in the Siruvani Hills in Tamil Nadu focussing on two tribal groups – the 'Mudugas' and the 'Irulars' and has emphasized, from an ecological context, the importance of the role played by tribal communities in utilizing and safe guarding medicinal plant resources without causing much depletion of those resources.

Stapit (1996) studied the extent of use of important medicinal plants among 'Tharu' tribal groups in Nepal. The paper argued that while indigenous knowledge regarding the use of medicinal plants is increasing, the tribal medicinal system practiced by the 'Tharus' is being eroded due to forest depletion.

Stacey (1988) discussed the threat of extinction being faced by medicinal plants and also the erosion of the knowledge of traditional curing methods due to development drive. The author found that many species are nearly extinct before their potential value is determined.

Traditional medicinal knowledge is increasingly recognised even in the field of modern health care. This knowledge is being put to good use in a number of countries as a research topic to find out remedial measures against diseases like AIDS, Diarrhoea, Tuberculosis, etc., and also in primary health care. A review of some of the works in this regard is given below.

Anok Bonggo et al (1990) interviewed 292 traditional healers in Uganda to discover how diarrhoeal diseases were treated by them. Their findings indicated that traditional healers could play an important role in interventions to control diarrhoeal disease using modern oral dehydration therapy if they were assisted in improving their techniques.

Upadhyay (1990) described a novel use of neem (Azadirachia indica) oil, a traditional plant product, for long term and reversible blocking of fertility after a single intrauterine application. The possible mechanism of antifertility action of neem oil were discussed.

Siddiqui et al (1988) conducted an ethnobotanical survey in Northern India's Sitapur, Aligarh districts revealing wide spread use of medicinal herbs as abortifacient agents among rural women. They found that atleast four different types of herbs were being used with a high rate of success for the above purpose by the rural people.

Chaudhary (1986) developed a complementing model for evaluating folklore remedies and plants already in use. Also a future approach is suggested as to conduct trials at the spot where the folklore medicine are actually being used.

Yunus (1986) argued that, for Bangladesh, implementing the WHO's definition of primary Health care in terms of modern medicine is financially impossible. Therefore it is imperative to use the vast resources of indigenous herbal medicine.

Bannernan (1982) discussed the re-awakening of interest in the potential of plant products or in other words "exploitation of folklore in herbal practice on a scientific basis". He found out that even after 1949, around 2000 new medicinal herbs have been identified.

Ling (1998) reviewed the use of traditional medicine in Malaysia. The article presented information on 44 herbal plants that are used for the treatment of female diseases, general health, prenatal protection, post portum recovery and fertility control.

Brown (1996) studied the wide spread anecdotal evidence that certain herbal preparations of developing country's indigenous herbal practitioners can reduce certain symptoms of AIDS. Of the different therapies, he examined, the evidence on traditional Chinese medicine using the herb "Astralagus" which can stimulate the immune system and thereby increasing the production of antibodies is the best.

Ds'ouza (1993) discussed the benefits of using alternative medicine in remote rural areas with specific references to a tribal area in the district of Dhule of Maharashtra state, India, among the Bhils, Koknas and Vanjaras. He described how private profit seeking allopathic practioners were eventually replaced by medicine men commonly known as "vaidus" leading to the revival of traditional knowledge.

Chaudhary, (1993) tracked the progress and the difficulties faced by the ongoing quest for a herbal contraceptive in India. This would, most likely, markedly increase the number of couples practising family planning.

METHODOLOGY

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CHAPTER IV

METHODOLOGY

4.1 Introduction

The main objectives of the study can be fulfilled by a detailed study of the major components of the tribal medical system, viz., the Tribal Medical Practitioners (TMPs), Tribal Medicine Users (TMUs) and finally the medicines extracted from the forest medicinal plants used in this system. The medicines used are not synthetic drugs but are derived from the locally available forest medicinal plants, as a whole or its parts namely roots, barks, stems, leaves seeds, fruits, etc. The medicines are usually in the form of decoction, juice, paste or powder as the case may be. The therapeutic properties of these medicines can be evaluated only by scientific pharmacological, biochemical and phytochemical studies and hence naturally does not come under the purview of the present study. An attempt has been made to study the remaining two components, viz., Tribal Medicine Practitioners (TMPs) and Tribal Medicine Users (TMUs). However, the nature of collection of forest medicinal plants by the Tribal Medical Practitioners and the preparation of medicines was observed during field study. Curative effect of the medicine was assessed through user study.

4.2 Population of the study

The population of the present study consists of the Tribal Medicine Practitioners (TMPs) and Tribal Medicine Users (TMUs) in Kerala. It would be very useful to have a brief description of the population so that one may be able to assess the parameters involved in the population.

4.2.1 Geographical characteristics

Kerala is located in a narrow strip of land in the south west corner of India, between lat. 8°17' and 30" and 12°47' and 40" North and long. 74°24' and 47" and 74°51' East. It stretches from Kasargod in the North to Thiruvananthapuram in the South (about 600 km) and from the Western Ghats in the East to the Arabian Sea in the West (about 120 km in the widest point and as narrow as 11 km at the South and North). There are 41 west-flowing and 3 east-flowing rivers, in addition to a chain of backwaters connected by man made canals running parallel to the sea, running through the state. The layout of Ghats, the course of the rivers, and the location of the lagoons have contributed to the division of the state into three natural regions – highland, midland and lowland, in that order from East to West. Comparatively good rainfall (about 300 cm) from the two monsoons per year and a moderate temperature make the land fertile and perennially green, though the monsoons have been causing damage to life and property in recent years.

4.2.2 Administrative divisions

Kerala is divided into 14 districts, 61 taluks, 1452 villages that support 3.44 percent of the total population of India. Each of the fourteen districts is under a district Collector. A district is divided into taluks, which is further divided into villages, the smallest revenue administration unit.

4.2.3 Area and population

The state has a total area of 38,863 sq. km., and a population of 29.1 million and has a population density of 749 persons per sq. km., which is more than twice the national average and the second highest among the states of India.

4.2.4 Ethnic composition

Kerala is a multi-religious state comprising Hindus (57.3% of the Kerala's population), Muslim (23.3%) and Christians (19.3%). Scheduled Castes (SCs) form about 10 percent of the population of Kerala compared with 17 percent in India and Scheduled Tribes (STs), a mere 1 percent compared with 8 percent in the country.

4.2.5 Demographic indicators

Kerala is unique in being the only state to have a preponderance of females over males and a sex ratio of 1036 as compared to all-India figure of 927.

4.2.6 Socio-economic development

Kerala has distinguished itself on many counts like literacy, health, etc.

4.2.7 Literacy

It stands foremost among the states of India with respect to literacy rate of 89.81 percent as against the all-India average of 52.21 percent. The female literacy rate is 86.17 percent in Kerala as compared to 39.29 percent for the country as a whole.

4.2.8 Health indicators

Kerala ranks first with respect to number of hospital beds (255 per 1000) and fourth with respect to number of dispensaries (6 per 10000). Kerala is third among the major states with respect to the number of doctors per lakh population, the first and second being Karnataka and Maharashtra respectively and the values are Karnataka 62.4, Maharashtra 58.2, Kerala 54.3, (Ministry of Health and Family Welfare Year Book – 1989-90). As per the 1991 census, Kerala has 95.9 doctors per lakh population when the different systems of medicine such as Allopathic, Ayurvedic and Homeopathic are together considered. The total number of registered doctors as per 1991 census is 27,813 out of which 17,532 are in Allopathic, 3636 in the Homeopathic and 5,702 in the Ayurvedic systems of medicine and the remaining 943 are Dentists. Thus taking all the systems together, there is one doctor for about 1045 persons. Further, the total number of beds available in all medical institutions (both Government and private) is around 90,700 (with more than 55 percent

contribution from private sector) giving a bed-population ratio of 312 per lakh populations (NCAER, 2001).

4.2.9 Forests – basic facts

The recorded forest area of Kerala, by legal status, is 1,122 million hectar. That is 28.9 percent of the total land area of Kerala is forest. But much of this is not "effectively" forest because there are encroachments, and some areas diverted for non-forestry uses continue to be legally shown as 'forests'. The actual forest cover as reported by the Forest Survey of India is 1,033.6 million hectar (25.67 percent of the land area). The per capita availability of forest was marginally over 0.03 ha., as against all-India average of 0.11. The world average of per capital forest area is 0.64 and that developing countries is 0.50 (Menon, 2002). Table 4.2.1 illustrates the different forest type in Kerala and its area.

Table 4.2.1

Area by Forest Type in Kerala

Forest Type	Area (million ha)	% of total
Tropical wet evergreen forest	0.3480	37.02
Tropical semi evergreen forest	--------	-------
Tropical moist evergreen forest	0.4100	43.62
Tropical dry desiduous	0.0094	01.00
Montane subtropical forest	0.0188	02.00

(Source : A Handbook of Kerala, 2002)

The Ayurvedic herbs and medicinal plants obtained from this forest region for the year 1994 is furnished below as Table 4.2.2.

Table 4.2.2

Ayurvedic herbs and medicinal plants from Kerala forest

Product	Quantity (Kg)
Ayurvedic herbs	5,56,021
Medicinal Plants	40,777

With the above physical and geographical characteristic background of Kerala, we can have a look at the population of the present study, which consists of the TMPs and TMUs. These two groups of the population are so closely interlinked that any variation in one group will invariably cause an effect on the other. More precisely, an influential and potential TMP with sufficient knowledge in tribal medicine can attract a substantial number of patients and this system of medicine will survive mainly through these types of practitioners. Conversely, if practitioners are less efficient, then naturally the number of patients visiting them will fall and this will affect their income and social status. So it can be seen that the quality of the practitioner is one of the factors affecting the survival of the system.

On the other hand, if an efficient practitioner lacks exposure and publicity to the outside world then definitely he will not get sufficient number of patients, which will affect his income, social status and prestige, adversely. Also the younger generation loose enthusiasm to start on such a profession and this will ultimately lead to the

extinction of this system of medicine. Hence, the quality of the practitioner and the number of users of the system of medicine are two factors, which influence the survival of the system.

The TMP belonging to different tribal communities are scattered in the forest area of Kerala in an uneven manner and they possess varying socio-economic background. Exact number of the TMPs in Kerala are not available from early statistics. However, Kerala Institute for Research, Training and Development Studies of scheduled caste and scheduled tribes (KIRTADS) has recognised nearly 80 TMPs during 2001, on the basis of their knowledge in tribal medicine and after giving due representation to all major tribal communities and geographical area. They use this list for further studies and distribution of annual grant-in-aid, etc., to the practitioners. But it is not a comprehensive list and so it alone cannot serve as a sufficient tool in this study. However, this list was also taken into account and it provided sufficient insight about the distribution of TMPs in Kerala.

As far as the present TMUs in the present study are concerned, it is not a homogenous group. It now includes tribals as well as non-tribals in rural and urban area.

In early days, the tribals wholly depended on their own system of medicine. They were very backward communities and majority of them lived inside the dense forests resisting outside influences and they possessed an effective medical system, which have time-tested knowledge about etiology and curing.

The openings of a number of dispensaries, hospitals and health centers by the Government in the tribal areas and the occurrence of new type of diseases among the tribals forced them to experiment the modern system of medicine like Allopathy, Ayurveda, Homeopathy, etc. As things stand today, they have options to choose different systems of medicine and so the tribals are not depending upon the tribal medicine alone.

At the same time, today we can see an unprecedented resurgence of interest in herbalism and plant-based medicines in the modern society because of the dangerous and untolerable side effects of synthetic drugs. The herbal drugs and medicines are considered to be without side effects, healthful and absolutely safe (Karnick, 1994). Moreover, organization like KIRTADS and other non-governmental organization conducts workshops and camps for the TMPs in non-tribal areas. This provided opportunities for the non-tribals in rural and urban areas to acquaint with the potentialities of Tribal medicine. As the tribal medicines are less expensive and without side effects, it attracts many. The reliance of many non-tribals on Tribal medicine is being increasingly recognised.

From the above descriptions, it is clear that the population of the study exists as two non-homogenous groups, viz., the TMPs and TMUs. Since these groups are unevenly distributed over the entire geographical area of the Kerala state, it would be practically very difficult to apply the census method of data collection. So we resorted to sampling technique.

4.3 Selection of sample

Taking into account of the unique peculiarities involved in our population under study, proper care has been taken to draw a reliable and representative sample from the population. First of all it was decided to select the sample study area for the selection of TMPs and TMUs. But, before selecting the sample study area it will only be proper to have a cursory look at the tribal distribution in Kerala.

On the basis of the historical, ethnic and socio-cultural relations Dr. Mathur has divided the tribal communities living in different regions of Kerala into seven major territorial groups, viz., Kasaragod, Wayanad, Attappady, Nilambur, Parambikulam, Idukki and Trivandrum. A brief account of each division is given below.

(a) **Kasaragod:** This zone comprises the two taluks of Kasargod and Hosdurg of the Kannur district. The most important tribal communities living in this region are the Koragas and Maratis. The Koragas are one of the most backward tribal communities of Kerala. In the 1971 census they numbered 724. They are mainly engaged in basketry.

(b) **Wayanad:** This region consists of North Wayanad of the Kannur district and South Wayanad of the Kozhikode district. The average elevation of the Wayanad plateau above sea level is 3000 feet. The main tribal communities which inhabit the region are the Paniyans and Kurichians, Mullakurumam, Uralikuruman or Vettukurumbar, Kattunaikkars or Ten Kurumbans, Wayanad Kadars, Adiyans, Pulayans, Kunduvadiyans, Kalanadis, Techanad Muppam, etc.

(c) **Attappady:** This is one of the prominent forest regions of Kerala. This valley is situated in the Mannarghat Taluk of Palakkad district. Most parts of the valley have an elevation ranging from 1,200 ft. to 3000 ft. The three tribal communities living in this valley are the Irulars, Mudugars and the Kurumbars.

(d) **Nilambur:** Nilambur is well known for its evergreen forests. The Nilambur forest division is situated in the Manjeri taluk of the Malappuram district. The important tribes living in this region are the Cholanaickans, Aranadans, Allars, Paniyans and Kurumans. The Cholanaickans, the cave men of Kerala, inhabit the reserve forests of the Karulai range and the Cherngathara range of the forests in the Nilambur valley, Malappuram district.

(e) **Parambikulam:** This zone is located in the Chittur taluk of the Palakkad district. The most important tribe, which inhabits the region is the Kadars of Cochin.

(f) **Idukki:** This comprises the mountainous taluks of Pirmade, Udumbanchola, Devicolam and Thodupuzha. It has an area of 5068 sq. km. About half of the area in the zone comes under Government Reserve Forests. Idukki has no rail link. The major tribal communities living in the region are the Uralis, Muthuvans, Hill Pulayans, Mannans, Mala Ulladans and Mala Arayans.

(g) **Trivandrum:** This region consists of Nedumangad and Neyyatinkara taluk of the Thiruvananthapuram district. The most important tribal community living in this region is the Kanikkar of Travancore.

Since the above division is not district-wise, it was observed that some zones like Kasaragod and Wayanad are spread in more than one district. Moreover Palakkad district comprise two zones, Attappady and Parambikulam. Secondary data available from census reports, year book, etc., were also used in the present study. Since these secondary data provide only district-wise details and because of the difficulty in identifying the exact boundaries of each of the above mentioned zones, the division made by Dr. Mathur was not suitable for this study.

4.3.1 District-wise study

On the other hand, the district-wise division of TMPs and users will facilitate easy comparison of the primary data with the available secondary data and so it was decided to have a district-wise sample study. Some relevant district-wise details were taken into consideration before the selection of the districts.

4.3.1.1 District-wise population of scheduled tribes

The Population of scheduled tribes in the different districts of Kerala is illustrated in Table 4.3.1. From the table it is clear that Wayanad and Idukki districts have higher number of scheduled tribe population. It is also clear from the Table 4.3.1 that 97.88 percent and 98.53 percent of the total tribal populations of these two respective districts are living in rural areas.

Table 4.3.1
Scheduled tribe population in Kerala

	Total	Rural	Urban
Kerala	**320,967**	**309,764**	**11,203**
Kasaragod	29,283	28,924	359
Kannur	18,243	17,640	603
Wayanad	114,969	112,543	2,426
Kozhikode	5,407	4,942	465
Malappuram	10,555	10,574	41
Palakkad	35,465	34,899	566
Thrissur	4,051	3,891	160
Ernakulam	4.941	2,202	27.39
Idukki	50,269	49,531	738
Kottayam	17,996	17,582	414
Alappuzha	2,801	1,732	1,069
Pathanamthitta	6,922	6,590	332
Kollam	3,884	3,443	441
Thiruvananthapuram	16,181	15,331	850

(Source : Census of India 1991, Series – 1 India, part II B (iii): Primary census Abstract-Scheduled Tribe Population).

4.3.1.2 District-wise density of population

The district-wise density of population, their sex ratio and percentage of Scheduled Caste and Scheduled Tribe population is illustrated in Table 4.3.2.

Table 4.3.2

District-wise population density, sex ratio and percentage of SC/ST

Density	Population density	Sex Ratio	Percentage	
			SC	ST
Kasaragod	538	1027	7.64	2.73
Kannur	759	1050	4.05	0.81
Wayanad	316	966	4.14	17.10
Kozhikode	1,118	1027	7.04	0.20
Malappuram	873	1053	8.25	0.34
Palakkad	532	1061	15.89	1.48
Thrissur	903	1086	12.22	0.14
Ernakulam	1171	1000	8.58	0.17
Idukki	215	975	14.55	4.66
Kottayam	830	1003	7.43	0.98
Alappuzha	1416	1051	9.51	0.13
Pathanamthitta	450	1063	13.29	0.58
Kollam	967	1036	12.69	0.16
Thiruvananthapuram	1345	1036	11.65	0.54
Kerala	**749**	**1037**	**9.91**	**1.10**

(Source : South India Human Development Report, 2001)

From Table 4.3.2, it is noted that Wayanad and Idukki are the two districts having highest percentage of Scheduled Tribe population and these are the only two districts having sex ratio less than 1000, that is, having a preponderance of males over females. Moreover, the densities of population of these two districts are the least.

4.3.1.3 Ranking of districts on the basis of development

While ranking the districts in respect of five indicators namely, per capita income (for 1991-92 at constant 1980-81 prices) [PCY], percentage of urban population (U), Number of motor vehicles per kilometer length of road [MV], Number of hospital beds per lakh population [HB], Percentage of work seekers to total population [WS] (all indicators on the basis of 1991 census), the result obtained is shown as Table 4.3.3.

Table 4.3.3

Ranking of districts in respect of five indices

District	Rank of districts for					All indicator	
	PCY	U	MV	HB	WS	Score	Rank
Kasaragod	11	9	12	12	2	46	12
Kannur	12	1	9	11	4	37	8
Wayanad	3	14	14	6	3	40	10
Kozhikode	10	3	3	10	6	32	3
Malappuram	14	12	10	14	1	51	13
Palakkad	13	10	10	13	5	51	13
Thrissur	8	6	6	8	7	35	6
Ernakulam	1	2	2	2	10	17	1
Idukki	2	13	13	3	8	39	9
Kottayam	4	8	8	1	12	33	4
Alappuzha	7	5	5	7	13	36	7
Pathanamthitta	5	11	11	4	9	34	5
Kollam	9	7	7	9	11	43	11
Thiruvananthapuram	6	4	4	5	14	30	2

(Source : South India Human Development Report, 2001)

As per the Table 4.3.3, the Ernakulam district ranks first, while Malappuram and Palakkad ranks last. With these relevant details of the districts in mind the sample study area were selected.

4.3.2 Selection of sample study area

Out of the 14 districts in Kerala, three districts namely Wayanad, Idukki and Thiruvananthapuram were selected for the sample study taking into account of the geographical location, characteristics of tribal population, district-wise ranking of development, presence of various tribal communities in these districts. The reason for selection of the three districts are justified as follows.

Geographically saying, the three selected study area are roughly situated at the lower, middle and upper parts of the tribal concentrations in the Kerala State.

Total tribal population in Kerala state is 3,20,967. The three selected districts together holds 1,81,419 (56.5%) tribal population, which is slightly more than one-half of the total tribal population. Wayanad and Idukki districts have the highest and second highest (17.10% and 4.66%) percentage of Scheduled Tribe population with least density of population 316 and 215 respectively, while the third district Thiruvananthapuram has a low percentage of Scheduled Tribe population (0.54%) but have a higher density of population (1345).

From Table No. 4.3.3, ranks of the Wayanad, Idukki and Thiruvananthapuram district in respect of 5 indices were 10, 9 and 2 respectively. The average of these three ranks is $7\left(\frac{10+9+2}{3}=7\right)$, which is exactly the middle-most rank of the 14 districts. Out of these three districts, Thiruvananthapuram is better developed (rank 2), while Idukki and Wayanad are medium developed (rank 9 and 10 respectively). Hence in this aspect also the selection of the sample is justified.

The 21 major tribal communities residing in the forest area of Kerala are Irula, Kadar, Kani (Kanikkar), Kattunaikka, Kurichia, Kurumba – Attappady, Mala Arayan, Mala Pulaya, Mala Muthan, Malapandaram, Malasser, Malavedan, Malayar, Mannan, Muduga, Muduvan, Pania, Cholanaikka, Ulladan, Urali and Uralikuruma (Menon, 2000). Out of this 21 tribal communities 10 are covered in the study area as follows:

Wayanad	-	Kattunaikkar, Kurichia, Pania, Uralikuruma
Idukki	-	Mannan, Muduvan, Malapulaya, Ulladan, Urali
Thiruvananthapuram	-	Kani

Numerically the largest single community in Kerala is Pania and they are forest dwelling (Menon, 2000). The Kanis lead a strenuous life and they are still nomadic agriculturists. Kurichians consider themselves superior to all the tribes and castes and are very orthodox. Uralis were aboriginal race belonging to the negrito stock and were hunters and shifting cultivators (Shashi, 95). Muthuvans are very backward and

majority of them live inside dense forest. Mannan tolerate the freedom of individual members (Boban, 1998).

With this discussion of the tribals, the rationale for selection of the three districts, viz., Wayanad, Idukki and Thiruvananthapuram in the sample study area is amply justified. Since the domain of the study spreads over the entire geographical area of Kerala state, the data collected from the three selected districts were pooled together into a single unit and no separate district-wise analysis was made. It is also feared that separate analysis will cause data inconsistency due to small size especially the data of the TMPs. Under such situations, the inferences made may not reflect the real situations and may be deceiving. Now the selection of sample from these geographical area was done as described below.

4.3.2.1 Selection of TMPs from study area

Since the exact number of TMP in the population was not known, the size of the sample to be selected from the population was not pre-determined. However keeping in mind the number of TMPs in Kerala enlisted by KIRTADS (80 numbers), it was decided to completely enumerate the tribal practitioners from the three selected districts.

For this purpose, the major tribal colonies in the three districts were firstly identified. Then it was decided to visit these colonies to identify and prepare a list of practitioners. This was done with the help of local leaders and then compared the list

with the list of TMPs recognised by KIRTADS. Some voluntary organisations were also consulted for preparing the list of TMPs. Finally 30 TMPs were identified from this study area.

4.3.2.2 Selection of TMUs from the study area

Reliable statistics about the tribal medicine users in Kerala was also not available. A field survey in search of tribal medicine users in Kerala which now include both tribals as well as non-tribals, will be tantamount to the complete enumeration of the Kerala population and hence not practical. It was kept in mind that the size of the sample TMUs has a relation to the degree of accuracy of the study. Ordinarily the bigger the sample size, the greater would be the accuracy, but a very big sized samples is likely to become unmanageable and is often unnecessary. However, in order to make the comparison and further analysis more easy, it was decided to select a random sample of size 100 from the TMUs.

As the TMU's now includes tribals as well as non-tribals and since the proportion of TMUs among the tribals and the same among the non-tribals are not known, the weightage to be given to the tribals and non-tribals in the proposed sample of size 100 cannot be pre-assigned.

To make the study more analytic and meaningful, it was decided to select those users who consult the practitioners already selected from the three districts. Since an influential TMP can attract users from distant places, there is a possibility that these

users may not be strictly confined to the three selected district but can be from other districts also. Neglecting that probability, the procedure for the selection of the 100 users from the three districts are described below.

While visiting the TMPs, it was noticed that most of them, who are recognised by the KIRTADS, maintain an address record containing the name and address of their clients and name of disease, etc. In order to get the annual grant from KIRTADS, the tribal practitioners have to maintain such a record. Some of these records were perused and it was found that the entries in the record were made by the visiting users (as inferred from the varying style in handwriting, colour of ink used). The record seemed somewhat genuine and it contained mainly the address of non-tribal users in rural and urban area. This record alone cannot be used as a source of information for identifying the user for many reasons.

Generally the literate tribals alone can enter their details in this record. The details of the illiterate users are thus not available from the record. The effective literacy rate in the Wayanad, Idukki and Thiruvananthapuram districts are 82.72 percent, 86.93 percent and 89.21 percent respectively (Census 1991). This shows that a small percentage is still illiterate and normally they are not adequately represented in the sample if the whole sample is selected on the basis of the record maintained by the tribal practitioner alone. Secondly as mentioned earlier, all the TMPs are not recognised by the KIRTADS and even all those recognised are not maintaining an address record. Thirdly, since the total number of patients visiting in

an year is taken as a criteria for evaluating the potentiality of a practitioner, there is chance to enter fake names and details to exaggerate the total number of users. However it was felt that the records maintained by the TMPs are a genuine source to identify users and so decided to select 50 users from these records.

4.3.2.2.1 Selection of users from the address record

From each of those 10 practitioners maintaining an address record, the details of 6 users each were selected from their record by resorting to the circular systematic sampling so as to get a sufficient sample of 50 users.

4.3.2.2.2 Selection of users from the spot

The other 50 users were selected from the remaining 20 TMPs who have not maintained an address record by a Simple Random Sample With Replacement. (SRSWS) technique as detailed below.

On a particular day, the researcher waited near the house of a TMP who had not maintained an address record and watched the patients visiting him. They were interviewed by the researcher on their return. This process was repeated for all the remaining 20 TMPs to obtain the sufficient sample of 50 users in such a way that not more than 5 users were selected from any TMPs and as far as possible atleast one user was selected from each of the 20 TMPs.

There is definitely an advantage in selecting the users in the two different ways described as above. By using the first method, it is possible to select clients who had been using the medicine for the past few years. This category of users will be in a better position to assess the system and comment about the recurrence of the disease, side effects of the medicine if any, expense incurred, etc. The category of users selected by the second method was current users and their opinion reflected the current trends.

4.3.3 Data collection method

Primary data collected by direct personal interview method with the help of interview schedule as well as observation method was used for this study.

4.4.1 Interview schedule

Two separate interview schedules having structured as well as unstructured questions were prepared for eliciting information from TMPs and TMUs. While preparing the interview schedule, the objectives of the study were kept in mind.

The major study variables included in the interview schedule of the TMPs were age, sex, income, education level, year of initiation of the profession, method of collection of medicinal plants, preparation of medicine, average number of patients, average monthly income, transfer of knowledge to disciples, preventive medicine, belief in evil spirits, cause of disease, impact of modern medicine, method of diagnosis, etc. [A copy of the questionnaire is given as Appendix I].

The major study variables included in the interview schedule of TMUs were age, sex, community, income, educational qualifications, name of diseases, curation of disease, expenditure incurred, attitude towards the system of medicine, mode of approach (whether approaching directly or after trying other systems), etc. [A copy of the questionnaire is given as Appendix II].

4.4.2 Field work

The field work of the study was carried out during 2001 from March to July in the three districts Wayanad, Idukki and Thiruvananthapuram.

With the help of the schedule in hand, the informants in the sample were interviewed and the responses were noted. Observation was also made simultaneously.

While collecting the information from the selected TMPs, the researcher accompanied local village leaders and literate tribals to earn a rapport with them. This also helped to convince the real intention of the researcher and to tackle the communication difficulties faced due to the dialect of the tribes. During the field work, the researcher felt a discernible reluctance from the tribal practitioners, especially from the very aged ones. They were always suspicious about the real intention of the researcher. All the TMPs consulted were reluctant to disclose the details of the method of treatment and medicine used by them. They keep it as a secret. One interesting incident which deserve mention in this connection is

described. The researcher along with local village leaders approached a very old practitioner in the Kappiset Colony, Chettappalam P. O., in Wayanad area. On hearing the intention of the visit, he was annoyed and shouted furioulsy "Who told you that I am a practitioner. I don't know anything about Tribal Medicine, you better go". He irritatedly went inside his hut and closed the door. While returning, some tribals from the nearby huts consoled and said "He was annoyed because of seeing a stranger. Today also he gave medicine to a child in this locality". The researcher politely and skillfully tackled many such situations. Many aged practitioners had doubts regarding their exact age, income earned from practices, concept of preventive medicine, etc. In such situations indirect and supplementary questions were asked not only to the TMPs but also to their relatives, neighbours, etc., so as to elicit the sufficient and relevant information.

One significant feature of the carriers of folk medicine is that the healers do not under take medical service as full-time vocations. The healers may be farmers, labourers, barbers, shopkeepers, blacksmiths (Shankar, 2001).

The above observations that the practitioners do not undertake their profession as a full-time vocation was found to be true during field survey. When the researcher visited the houses of TMPs, some of them were not in their house. Either they were in their own field or had gone out for agricultural and other jobs. At the time of visit to their houses, some TMPs were out for the collection of herbs and plants and it consumed much time.

The search for the TMUs with the help of the details collected from the address record of TMPs was also time consuming work.

4.5 Scrutiny and Editing of Data

Firstly the interview schedules of TMPs were carefully scrutinized after omitting inaccurate, unsuitable and incomplete ones, 30 schedules were obtained for analysis.

The schedules of the TMUs collected by the two already mentioned methods were scrutinized seperately. After a thorough scrutiny of the data collected by the first method, 50 schedules which were complete and reliable were selected. The data collected by the second method was also scrutinized and from among them 50 schedules were selected after giving proper representation of the geographical area and to the tribal, non-tribal users.

4.6 Statistical Techniques Used

The data generated for the study were analysed statistically. The necessary distribution tables and diagrams were constructed. Statistical averages like mean, mode, etc., and measures of skewness and kurtosis like β_1 and β_2 were also calculated. Chi-square test was used to find association of attributes. Observations made during the field study was also interpreted with the help of relevant studies.

ANALYSIS AND INTERPRETATIONS

Asha B. “A study of the application of information technology in tribal medicine in Kerala with regard to forest medicinal plants ” Thesis. Department of Library and Information Science ,University of Calicut, 2002

CHAPTER V

ANALYSIS AND INTERPRETATIONS

This chapter contains analysis of data arranged into two sections 5A and 5B. Section 5A consists of the analysis of the data collected from the Tribal Medicine Practitioners [TMPs] and 5B consists of the analysis of the data collected from the Tribal Medicine Users [TMUs].

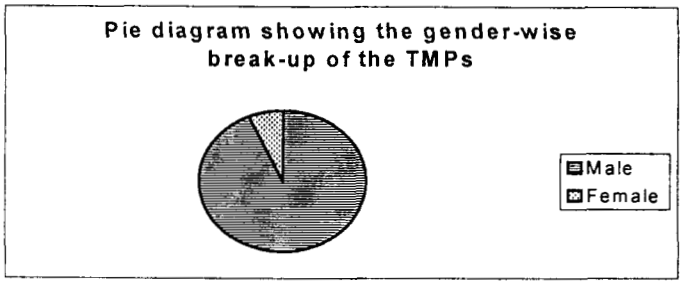
5A. Analysis of the data collected from TMPs

The data collected from the TMPs were analysed to learn the various aspects of their socio-economic back ground, medicinal practices, attitudes towards the profession, etc. Some general observations made about the TMPs, were also described at the end of this section.

5A.1 Gender-wise break up of the TMPs

The study revealed a clear male dominance among the tribal practitioners. Out of the 30 TMPs studied, 28 (93.33%) were males and only 2 (6.66%) were females.

Figure 5A.1



5A.2 Age-wise Distribution of TMPs

Tribal Medicine form the unwritten repertory of health practices that have been passed down the generation through word of mouth for atleast one century and continues to be passed down even today. The knowledge and practices of tribal medicine is not recorded anywhere. A TMP acquires the knowledge from his predecessor and he practices it and finally he transfers the acquired knowledge to his next generation before his death. So a TMP can be viewed as a medium through which the tribal knowledge and experience of medicine are transferred to the next generation.

A study, which analyses the present status of tribal medicine, will be futile without a study of the age of the present tribal practitioners. This is because the age is a very crucial factor in judging how far the practitioner would be active in his career. Further the age study will provide a view of the participation of younger generation in the tribal medical profession, which is an indispensable factor for the survival of the

tribal medical system. So it is attempted for an age-wise distribution of TMPs. The details obtained are shown in table no. 5A.2.1

Table No. 5A.2.1

Distribution of TMPs in Kerala by age

Age	No. of Practitioners	Percentage
Below 30	Nil	Nil
30-39	3	10.00
40-49	4	13.33
50-59	5	16.67
60-69	5	16.67
70-79	9	30.00
80-89	2	6.67
90-99	2	6.67
Total	30	100.00

From Table 5A.2.1 it is observed that 30.00 percent of the TMPs are in the age group 70-79 and a total of 13 TMPs (43.33%) are above 70 years of age. This becomes more significant when one compares this with the average life expectancy of a person in Kerala. As per the 1991 census the average life expectancy in Kerala is 69.5 years, which is highest among the Indian states. So it can be safely concluded that nearly 43 percent of the TMPs in Kerala have already completed their expected lifetime. Table 5A.2.2 showing the percentage distribution of population of India by age from

1993-96 is useful for further comparison of the age wise distribution of TMPs as illustrated in Table 5A.2.1.

Table 5A.2.2

The percentage distribution of population of India by age and sex from 1993-96

Year	Age 0 – 14		Age 15 – 49		Age 50 +	
	Male	Female	Male	Female	Male	Female
1993	36.4	35.8	51.1	50.9	12.7	13.4
1994	36.8	36.1	50.4	50.5	12.9	13.5
1995	37.1	36.3	50.1	50.2	12.8	13.4
1996	36.9	35.9	50.5	50.5	12.7	13.6

(Source : Family welfare programme in India, Year Book 1997-98)

From Table No. 5A.2.1 it is clear that the number of practitioners above 50 years of age is 23 (76.66%) But table 5A.2.2 shows that the percentage of the population of India above 50 years in the year 1996 is 12.7 percent for males and 13.6 percent for females and the average percentage calculated is 13.15 percent. From this glaring difference between the two percentages (76.66% and 13.15%), it was safely concluded that the age-wise distribution of TMPs in Kerala are not in the general pattern of the distribution of the Indian population for above 50 years.

The mean age of the TMPs in Kerala, calculated from table 5A.2.1 is 64 years. When this value is compared with the average life expectancy in Kerala (69.5 years), one can infer that the group of TMPs in Kerala, consists of more elders than youngsters.

The disinclination of younger generation towards this profession is also clearly depicted in Table 5A.2.1. No practitioners below the age of 30 years were found in the study. This aspect assumes relevance only with a comparison of the average age of initiation of a practitioner to the profession, which is done in the section 5A.3.

5A.3 Age of initiation

The analysis about the average age of TMP will be meaningful and complete only with a study of the age of initiation into the profession. Even though some of the aged tribals had no clarity about their age of initiation, supplementary questions were asked to them, their neighbors and relatives to elicit somewhat reliable information.

It was found that 27 out of the 30 TMPs (90%) in the study had been initiated before 22 years of age and the remaining 3 (10%) were initiated before 28 years.

A perusal of the age of initiation of TMPs obtained in this section with table 5A.2.1 reveals that there exists a gap of 2 years between the lower limit of the age of TMPs (30 years) and upperlimit of the age of initiation (28 years) of tribal practitioner into the profession. As the age of TMPs are increasing with the passage of years, their average age will also increase unless sufficient number of new entrants of lower ages

are initiated into the profession. It was inferred that this gap would not have generated if sufficient practitioners of lower age were added to the group of TMPs.

The age gap of 2 years noticed definitely indicates a significant fall in the number of new persons attracted by this profession. Unless we make some sincere and fruitful effort to attract new recruits of younger generation into this profession, this gap will widen on passage of time, which will eventually lead to the extinction of this system of medicine.

Today in modern pedagogy it is an undisputed fact that in order to maintain quality in a profession, the training into it should start at a younger age. Here it was found that all the tribal practitioners initiated their profession at a relatively younger age (before 28 years). Hence it can also be inferred that the tribal understanding of pedagogical process in the realm of medicine was based on the principles of modern pedagogy.

5A.4 Transfer of knowledge

As mentioned earlier, the tribal knowledge of medicine is not recorded anywhere and is passed down the generation through word of mouth only and also from 5A.2.1 it was inferred that the group of TMPs in Kerala includes more elders than youngsters. In this situation the fact whether the TMPs had transferred their knowledge to their sishyas (students) assumes significance.

Out of the 30 TMPs studied, 28 of them possessed sishyas and 2 had no sishyas at the time of data collection. These two practitioners were part-time professionals and were not seriously engaged in this profession. They were relatively younger age of 43 and 51 years.

The sishya of a TMP is not a formal student as in the usual sense but usually may be a close relative or a member in his house. There were more than one sishya for a TMP. The TMPs evaluate their sishyas till the most interested, dedicated and suitable one is identified. Once such a person is identified the TMP will transfer all his knowledge including secret knowledge if any, to him before his death.

It is observed that the TMPs showed an explicit preference for male sishyas from their close blood relation like son, nephew, etc. Out of those 28 TMPs possessing sishyas, 22 (78.57%) have male sishyas of their blood relation. So it was concluded that family bond is a strong criteria in the selection of sishyas by the TMPs. Details collected in the study about the transfer of knowledge of the TMPs to their sishyas are set out on table 5A.4.1.

Table 5A.4.1

Transfer of knowledge of the TMPs to their sishyas

Knowledge transfer to sishyas	No. of Practitioners	Percentage
Completely transferred	11	36.66
Partly transferred	17	56.66
No sishyas	2	06.66
Total	30	100.00

Table 5A.4.1 shows that more than half of the TMPs do not seem to have fully transferred their knowledge to their younger generation. This aspect also deserves concern because of the higher ages of the TMPs as explained in section 5A.2.

5A.5 Average monthly income earned from treatment.

Since income earned from a profession act as a motivating factor towards the profession and also since it decides social status of the profession, an attempt was made to determine the average monthly income earned by a tribal practitioner. Many practitioners were not in a position to provide the exact details of their monthly income because of the irregular fluctuations in the daily income. However a rough estimate of monthly income was arrived at and is set out as table 5A.5.1.

Table 5A.5.1

Monthly income earned by the TMPs from treatment

Average monthly Income	No. of Practitioners	Percentage
Below 2000	14	46.66
2001 – 5000	10	33.33
Above 5000	3	10.00
Not revealed /Don't Know	3	10.00
Total	30	100.00

It is evident from the table 5A.5.1 that 46.66 percent of the TMPs have monthly income below Rs. 2000. It was observed during field study that there existed a wide disparity in the monthly income of the various TMPs. Some potential and influential TMPs succeed to earn fairly good income while others fail to earn sufficient income from treatment.

Since income of a practitioner is directly related to the number of patients visiting him, an attempt was also made to estimate the average number of visitors of a TMP per day.

5A.6 Number of patients

The number of visitors per day is certainly an indicator about the social acceptance and efficiency of a TMP. Here also a wide variation was perceived. For some cases, it went up by more than 30 per day while for others, it was less than 2 per day. The details collected are presented in table 5A.6.1. The average number of patients calculated from table 5A.6.1 was nearly 7 patients per day per TMP.

Table 5A.6.1

Number of patients visiting the TMPs per day

No. of visitors/patients per day	No. of TMPs	Percentage
0 – 4	13	43.33
5 – 9	8	26.66
10 – 14	5	16.66
15 – 19	2	06.66
Above 20	2	06.66
Total	30	100.00

It was noted that some of the influential and potential TMPs were able to attract a good number of patients (correspondingly a higher income), which differed very significantly from the rest. This created some abnormal values in the corresponding data, which is represented by open ended class in tables 5A.5.1 and 5A.6.1. The results obtained from further analysis of these data will be deceiving because of the presence of abnormal values. Hence it was not attempted.

5.A.7 Selection of medicinal plants

As the medicinal plants and herbs used by the Tribal practitioners are neither reported nor recorded anywhere for their healing properties, the local application of many are some what different, different plants, parts or preparations or different species of the genus are used by the local medicinal practitioner.

Each TMP is aware of the healing properties of the medicinal plants in his surroundings only. In several situations, it may happen that different TMPs geographically separated may cure a disease with different medicines derived from the locally available plants and herbs For example the Muthuvan community in Idukki district grind the leaves of 'Kongini' (*Lanthana camera*) and Venappacha (*Blumera lacera*) and smear this paste in the fore head for headache while the Mannan community of the same district grind the leaves of 'Anachoriyanam' (*Girandinina diversifolia*) and apply this paste on the forehead for headache. Also it was observed that for chest pain the Muthuvans of Idukki crush the root of Edana (*Olea diocia*) and extract of the juice and drink. They also smear a part of it on the chest also while the Mannan's of Idukki prepare decoction by boiling the tubers of Naruneendi

(*Hemidesmus indicus*) and Chathavely (*Asparagous recemosus*) in water and drink for the same illness. There are many such examples to cite and generally the patients get relief to their illness. So naturally the question arise which among these medicines is most suitable and effective for a particular disease. Only systematic pharmacological and biochemical studies can answer this question.

There is a wide disparity in the existing practices of Tribal medicine. The different parts of the same plant is used to cure different illness. For example it is widely known that the stalk of the fruits of *Prunus aviam* is employed internally to pass kidney stone, but in the Mediterranean subdivision of Turkey, the stem is used for the same purpose (Yesilada, et al, 1993).

In Ayurveda, the common drug plant 'Kuruntotti' three names, viz., Bala, Athibala and Nagabala can be found. All of them are species of sida. When there are 11 species of sida in south India, only with the help of an excellent key based on floral characteristics or with the aid of authentic specimens these species can be correctly identified. When used as a raw drug, it is quite difficult to identify the roots of these species based on the morphological characteristics. No conclusive phytochemical study has been carried out to establish which species of Sida has the most beneficial alkaloid. Apart from the species of sida, species of Pavonia are also used as Kurunthotti. In the absence of such a study, it is arbitrary if an Ayurvedic Practitioner prefers a particular species as the source of Kurunthotti [Nambiar, 1985].

It is to be noted that the same plant species growing in different geographical, soil and climatic conditions posses varying chemical constituents and hence their therapeutic properties also varies significantly. In a study of the biogenesis of different chemical constituents by the herbal flora indicated that certain compounds are

preferentially produced by certain orders and families of plants. Thus, alkaloidal properties have been found to occur in some thrity-eight plant families and the occurrences of a well authenticated base in the remaining families is only occasional (Manske 1950).

It is reasonable to presume that the general occurrence of antibiotic substance in plants is in the nature of a protective mechanism against environmental factors, particularly the soil in which the plant co-exist with a host of different microbes and may be said to correspond to the production of antibiotically active metabolic products by living organisms, such as the actinomycetes and the fungi. This property, however, was found to differ greatly in its distribution from species to species and even among plant species belonging to the same genus. Thus, whereas Marinade Citrifolia has been shown to possess triple activity, the other species of this genus experimented upon, namely, *Morinda tomentose*, was almost devoid of any protective substance against the bacteria, the mycobacteria and the fungi. Similarly Grewia populifolia was found to be antibacterial and antitubercular in type, but Grewia Levigata had none of these characteristics. Relative quantitive difference were also observed to exit among allied species. Thus Pristimera grahmi was found to possess almost twice the amount of antibiotic quinone pristimerin as compered to pristimera indica, although both these species were collected from the same soil area. To these species differences, must be added, the discrepancy, which was noticed on more than one occasion in the antibiotic content of the same species when collected from the same area but at different times of the year. To quote only one example pueraria tuberosa collected from the Dangs forest area had promising antitubercular activity. When harvested at a difference time of the year from the same area, this plant material completely failed to come up to the previous expectation. It can be found that a

number of botanical considerations play an important role in the study of the physiological and the biological activity of different plants (Bhatnagar et al, 1961).

It is thus inferred that the same disease is treated with different locally available plants. Different parts of the same plant is used to cure a disease. The chemical constituents of a plant varies as its family and within the family it varies as genus and even within the same genus the constituents varies as species. More over it is noted that in the same species the constituents varies as soil area, environment factors and even with the time of harvestation. So the identification of plant and then its parts having most effective curative property to treat a particular disease, the ideal environmental factors, soil and time of harvest of such plants etc. can be determined only by combined modern scientific studies in botany, chemistry, Bio-chemistry, microbiology, Pharmacology and clinical medicine.

Now it is clear that an analysis about the selection of plants and herbs made by the TMPs for curing purpose is beyond the scope of this study. However it was attempted to study some basic collection habits of TMPs such as collection time, collection process, periodicity of collection, storage of the collected plants, dogmas in collection, etc.

5A.8 Collection of medicinal plants

The TMPs collects the medicinal plants and herbs either from their nearby surrounding forests or from the less accessible interior forests. While some plants and herbs are easily available in their surroundings, others are available only in the interior of the dense forest. Their approach is a need based one and not a general one.

5A.8.1 Medicinal plant garden

During the study it was noted that some TMPs maintained a medicinal plant garden near their houses, which consisted some frequently needed plants and herbs. These gardens are maintained with the financial assistance, seeds and saplings supplied by KIRTADS. Out of the 30 TMPs in the present study, 10 are recognised by the KIRTADS. Out of this 6 has maintained a fair collection of medicinal plant garden.

5A.8.2 Collection time

All the TMPs studied were unanimous about the time of collection. They opined that early morning before sunrise is the ideal time for collection of medicinal plants and herbs. They believed that plants and herbs collected in the morning time possessed maximum curative value. It is to be noted that early morning is the last phase of the period of time when photosynthesis is absent and only scientific investigations can provide an answer whether this point of time has any effect in the chemical constituents of the plants and herbs or is it merely a dogma of the TMPs.

5A.8.3 Helpers in collection process

From the study it was found that 9 out of the 30 TMPs mainly depended on the medicinal plants and herbs of their locality and from their medicinal plant garden. They seldom go in to the interior of the forest for collection of rare medicinal plants and herbs. On further observation of these 9 TMPs, it was found that they were either non-potential part-time practitioners or specialists in some particular fields like snake poison, bonesetters etc. These specialists and non-potential practitioners are satisfied with the local plants and herbs. The remaining practitioners depended mainly on the interior forest for plants and herbs, which were not locally available. The collections process first concentrated in easily accessible peripheral areas in forests and then slowly start moving to less accessible interior. Some TMPs are very particular to be alone in collection of plants and herbs from forest. They will not accompany any helpers during collection, mainly to keep the secrecy of the medicinal plants and herbs collected. The physical appearance of these plants and herbs are changed soon by cutting or drying, so that a person cannot easily identify the plant by its morphological characteristics.

Some other practitioners are accompanied by their sishyas (students) as helpers, while going inside the forest areas for collection. Even though it is found that the tribal practitioners try to hide the healing properties of each plant from them. The method of preparation and composition of these plants in the medicine for a particular disease

etc., will be disclosed only to a selected few, who are genuinely interested in tribal medicine.

There were eight practitioners who employed paid labourers for the collection of plants. These labourers will be given proper training by the practitioner before collection of the plants and herbs. After training they will be able to collect the same plants and herbs as desired by the practitioner.

5A.8.4 Periodicity of collection

The collection of plants and herbs are done on a regular basis. Some practitioners fix some particular days in a week exclusively for collection purpose. In the study it was found that 18 practitioners carried out the collection process in a regular manner, once or twice in a week. The practitioners usually returned to their houses in the noon or evening with sufficient stock for 2 to 3 days. Usually there will be no practices in those collection days.

5A.8.5 Storage of the collected plants and herbs

No special storage techniques were noted from the present study. The collected plants and herbs are cleaned, separated and stored in a cool place in their house without loosing its freshness for 2 or 3 days. As mentioned earlier some practitioners hide the identities of the collected plants in this stage also.

5A.8.6 Dogmas in collection

Before setting out to collect medicinal plants and herbs from the forest, they pray to their Gods and gurus. Some TMPs believed that Sundays, Tuesdays and Thursdays were auspicious days for collection of medicinal plants while some others believed that Tuesdays, Fridays and Sundays were good days for collection. Medicines collected in these auspicious days will possess more curative effect. TMPs in some parts of Idukki believed that shadow of a man should not fall on the plants before they collect them and so preferred early morning time for collection.

It is a general belief that plants, which grow in the cultivated gardens or places frequented by man and domestic animals lacked medicinal value. Some insisted special significance to the cleanliness and purity of mind of the collector. They rose well before the first rays of sun touches the earth, bathed, conducted special poojas and rituals, gave offerings to forest goddesses and set out chanting some 'manthras' for an early finding of the rare and useful plants and herbs from the forests. Further it is their belief that seasonal changes have some effects on the curative efficacy of the plants.

5A.8.7 Difficulties in the collection of medicinal plants and herbs

Medicinal plants have played a major role as the basic source for the establishment of several pharmaceutical industries and pharmacies including Ayurveda and other systems of medicine. Particularly the Ayurvedic pharmacies solely depend on wild medicinal herbs collected from the forests.

The herb collectors, employed by various organisations gather medicinal plants intensively from the areas familiar to them. Here also the collections are first concentrated in easily accessible peripheral areas in the forests and then start slowly moving to the less accessible interior parts. Owing to the unscientific way of extraction many areas in our forests have become depleted of certain valuable herbs.

The TMPs depend on the forest for the medicinal plants and herbs. But contiguity of the forest has been broken by the intrusion of farm lands, enclosures and habitation. The strict forest laws are also an obstacle for collection from some interior parts of the forest. With this background in mind the TMPs were studied and it was found that 18 out of the 30 TMPs (60%) faced some kind of difficulties in collection of plants and herbs from forests. They opined that certain valuable plants were not available now even in the interior of the forest. But others experienced no such difficulty in collection. But on the other hand 22 out of the 30 TMPs (73.33%) had some bitter experience from the forest department. Many of them complained about the hostile and non co-operative attitude of the forest officers and added that they

were prevented and questioned unnecessarily during the collection of plants and herbs from interior parts of the forest.

5A.9 Preparation of medicine

Some knowledge about the preparation of medicine is essential to perceive the tribal medical system. It is really an art. Most of the tribal medicines are prepared either from, single drug extracted from single plant or plant parts. The combination with other plants in tribal medicine is also not uncommon.

The major forms of medicines used by the TMPs in the study were dicoction, paste, powder, fresh juice by squeezing fresh leaves and other parts of plants and herbs, medicated oils etc. Eventhough some minor changes in the method of preparation were observed, the general procedures were the same and Table 5A.9.1 reveals the details of the different forms of medicine and their preparations.

Table 5A.9.1

Forms of medicine and their preparation

Forms of medicine	Method of preparation
1. Decoction	Clean, dry and fresh raw materials are cut into pieces and is boiled in water in a definite proportion and then reduce the quantity of water is reduced into about ¼ th of the original volume and is used internally.
2. Paste	Both fresh and dried plants or plant parts are made into paste on a stone and is used both internally and externally as the case may be.
3. Powder	The dried materials are cut in to pieces and pounded with the help of stones or any other such means and made into fine powder.
4. Fresh juice	The fresh medicinal plants or plant parts are cut into pieces and is crushed in mortar like stones or keeping in between the two palms. The juice extracted by squeezing the crushed bits is administered orally or applied externally. It is believed that the extract has the highest potency
5. Medicated oil	The fresh and dried materials are cut into pieces and are put in the boiled oil, for some time. Then the oil is allowed to cool and the preparation is mainly used for external application like massage.

Even though these are the main forms of medicine found, some other forms of medicines like water extracts, drops, fumes, massage balm, etc. are also found in some parts.

5A.10 Preservation aspect in tribal medicine

The deterioration of pharmaceutical products in modern medicine may be due to the chemical, physical and biological effects.

Chemical decomposition may be due to the presence of oxygen, carbondioxide or water vapour in the atmosphere; physical decomposition may result from extremes of temperature causing volatilization or precipitation. It can also be caused by moisture. Biological effects may be due to enzymes or micro organisms which include bacteria, viruses, yeasts or moulds which can be prevented by sterilization and storage in sealed containers or by use of preservatives.

The preservation aspect of tribal medicine was taken into consideration in the present study. It was found that the majority of the medicines used by the TMPs were prepared on demand and were not prepared in advance. A perusal of the table 5A.9.1 revealed that in any form of medicine, fresh or dried materials alone were used and hence the preservation aspect of the materials of the medicine did not arise since fresh and dried materials were less prone to biological or chemical degradation.

It was found that fresh juice and paste were prepared on demand and were consumed within two to three hours of its preparation. The decoction prepared is normally stored for two to three days. Generally the powder and medicated oils were stored for longer periods at normal temperature and these two forms were less inclined to deterioration due to physical, chemical or biological degradation under normal conditions.

In some cases the medicines were prepared by the users at their homes with the fresh/dried materials supplied and according to the directions provided by the TMPs. The preservation aspect can be ignored as these medicines are used immediately, without allowing deterioration.

It is thus inferred that even though the TMPs have no scientific knowledge of preservation of medicine, they avoid deterioration of the quality of the medicine by insisting on freshly prepared medicines.

5A.11 Preventive medicine

Preventive medicine really dates back to the 18th century. Curiously, it came into existence even before the causative agents of diseases were known (Park & Park, 1991).

On tracing history one can see that James Lind (1716-1794), a naval surgeon advocated the intake of fresh fruit juice and vegetables for the prevention of scurvy in as early as 1753. Edward Jenner (1749-1823) of Great Britain, discovered vaccination against small pox in 1796. These two discoveries marked the beginning of a new era,

the era of disease prevention by medicine. Preventive medicine has become a growing point in medicine (Alan, 1969).

Preventive medicine is now an integral part of the modern medicine. Preventive medicine is a kind of anticipatory medicine. It has now developed as a branch of medicine distinct from public health (Duncan, 1981).

In their day-to-day life the tribals do not take any special care in the prevention of diseases. They have some supernatural measures like wearing of amulet, offering of sacrifices to God, etc., which are believed to be capable of preventing illness (Boban, 1998).

Preventive medicine is an important aspect in every modern medical system. An analysis about the concepts of preventive medicine among the TMPs was undertaken in this study and it was found that their concept of etiology of diseases could be broadly divided into two viz. natural causation and supernatural causation. It is to be noted that the latter is influenced by several cultural factors and as culture varies with tribal societies, their concept of supernatural causation of diseases also varies widely.

The major natural causation of diseases were identified as exposure to rigorous climatic changes, poor diet, polluted and adultered food, etc. According to the TMPs studied, avoiding of excessive exposure to hot sun, climatic conditions such as heavy rain and severe cold, bad food etc are the natural ways to prevent diseases. Their

concept of preventive medicine is not based on the therapeutic properties of the medicinal plants.

The supernatural causes of diseases were identified as wrath of God, anger of ancestral spirits and evil spirits, violation of taboos and sorcery, etc. But different tribal societies follow different methods to prevent the diseases and these often seems irrational. To cite an example, in each muthuvan hamlet in Idukki district, there will be a 'Manthrakkaran' who functioned as a shaman found in the traditional anthrapological literature and also as a medicineman. In order to protect the attack of the evil sprits and sorcerers in future the 'Manthrakkaran' will erect fences around the hamlet. These fences are supposed to be made of steel and fire and are invisible to the eyes of ordinary mortals. This fence is a protective device against the attack of both evil spirits and sorcerers. After the erection of this fence, no evil forces can enter the hamlet and attack the people with diseases.

In the present study it was found that out of the 30 TMPs, 21 of them did not have any concept of preventive medicine and they did not have any medicine to prevent a disease. Another noticeable fact was that no user approached a TMP for preventive medicines. Remaining 9 TMPs have some concepts of prophylactic measures against diseases. They advise avoidance of excessive exposure to climatic conditions, bad food, etc., for the prevention of diseases by natural causes and some magical resources to prevent those diseases by supernatural causes. Out of the above 9

TMPs, only 3 of them claimed that they possessed medicines to prevent the attack of some diseases like small pox, asthma, chest pain, etc.

From the above findings, it is concluded that the users are not approaching the tribal practitioner for preventive medicines. A good number of TMPs did not have any concept about preventive medicine. It is a new thing for many of them. Even those who have some idea about the preventive measures are not competent to explain the prevention of a disease on the basis of the therapeutic properties of the medicine.

5A.12 Diagnosing methods

In modern medicine, the clinical qualities are determined by accurate diagnosis, appropriate treatment and the best possible outcome from the circumstances and patient conditions. Diagnostic tests are scheduled according to patient condition, age, health and preference whenever possible. A correct diagnosis is the first and most important aspect in allopathic treatment. Wrong diagnosis will definitely lead to wrong treatment.

The prevailing methods of diagnosis among TMPs were studied. Pal and Jain (1998) observe that diagnosis of the cause of illness either psychometric or physical always involves some sort of magical performance or rituals and not so much on the examination of the patients. But almost all of the TMPs in our study are not using magical or divination methods for diagnosis of diseases. On the other hand they observe the patient and mainly depend on his description about the illness. Some

physical examinations like touching the affected part or body, reading of the pulses, noting body temperature are also done to identify the diseases. It is not certain whether the TMPs are capable of assessing the severity, acuteness, etc., of the disease by the above methods. However it has to be admitted that their long and rich experience along with the practical knowledge will help them to some extent for diagnosis.

5A.13 Posology in tribal medicine

Posology is the branch of medicine dealing with doses. Doses cannot be rigidly fixed, as among other things, allowances must always be made for the age and condition of the patient and the severity of the diseases, natural tolerance, acquired tolerance, idiosyncracy (exceptional and individual tolerance towards certain disease), degree of absorption, etc.

Posological aspects in Tribal medicine were studied and it was understood that the TMPs did not have any method to calculate the doses after assessing the age, severity of the disease, or condition of the patient. It is generally noted that the dose prescribed for each medication is the adult dose and they claimed proportional reduction to children according to their age. But this was not observed in the field study because no child users could be found in this study. But in allopathic medicine there are well known methods like Young's formula and W. J. Dilling's formula to calculate doses proportionate to age. The doses are based on body weight also. It was

found that no TMPs in the study are taking the factors like age or body weight in determining the doses. However the general observation made about the dosage of medicine are illustrated as table 5A.13.1.

Table 5A.13.1
Adult dosage of each form of medicine

Form of medicines	Adult dosage
1. Decoction	About ¼ to ½ palmful approximately 10-16 ml to 20 – 30 ml in a day
2. Paste	5 – 6 gram approximately once or twice in a day.
3. Powder	About ¼ palmful nearly 10 – 16 ml once or twice in a day.
4. Fresh Juice	About ½ palmful about 20 – 30 ml once or twice in a day.
5. Medicated oil	About 3 - 6 ml is used at a time for one or two times daily.

The dosages in Table 5A.13.1 are only approximate and there were wide variations in dosages between TMPs.

5A.14 Cause of diseases

As pointed out in section 5A.11, the concept of etiology of diseases among the TMPs can be classified into natural causation and supernatural causation. In olden days the tribals believed only in supernatural causation. But today there is an obvious

change in their concept about the causating factors. TMPs who believe in the supernatural causation alone becoming uncommon. TMPs of today administer medicines than involving in magic, exorcism, sacrifices and propitiation to cure a disease. But it is noticed that even now some TMPs who depend on medicines to cure diseases also believe that certain diseases like chicken pox, epilepsy etc are caused by the wrath of God or certain spirits or supernatural power for which magical or divination methods are also needed. These beliefs have a deep influence on their attitude and psychology about the ailments. The magical methods of treatment of such diseases has its own effect on the patient. Practitioners believe that they can bring about the cure of illness or ward off the attack of an evil spirit by performing the ritual procedures. Beattie (1964) observes "the people who carryout such institutionalized symbolic procedures or rites usually believe that by doing so they are either producing some desired state of affairs or preventing some undesired one. In the study a TMP solely depending on magical method could not be found. On the other hand they combine some magical methods along with material medicine to treat some particular diseases like chicken pox, epilepsy, etc.

5A.15 Divination methods in treatment

The religious beliefs and myths played a major role in the earlier practices of tribal medicine. They used the divination methods for diagnosis and its possible remedies. This aspect was studied and it was found that, 10 out of the 30 TMPs (33.33%) selected are not using divination magical methods or mumbojumbos for

diagnosis of diseases, 20 remaining TMPs use divination and mumbojumbo on a selective basis. It is a general belief among the tribal communities that certain diseases like epilepsy, chickenpox, madness, etc., are caused by the wrath of God, evil spirits, breach of taboos, for which the magical and divination method is a remedy. The study revealed that 26 out of 30 TMPs (86.66%) combined medicine and magical methods to treat the above categories of diseases. When a patient inflicted by the above diseases are brought to them they will first give some material medicine to him and then start the divination and healing rituals. They usually chant various spells while giving this medicine to the patient and is often considered as a part of magic. Actually the material medicine itself may be sufficient, while the medicine provides symptomatic relief, the chanting spells drive away mental agony and the patient becomes more confident. It is observed that all TMPs prays and chants before giving the medicine to their patients. They pray to God for effectiveness of the medicine given and speedy recovery.

5A .16 Influence of modern medicine on TMPs

Since the tribal medicine practitioners are also a part of the tribal society, it will be meaningful to learn the influence of modern medicine on TMPs in the background of the influence of it on the tribal society.

5A.16.1 Influence of modern medicine on the tribal society

In the past, the tribals who led an effective isolation from other human societies, reduced the chances of being afflicted by most of the contageous diseases. Their living in the harsh environment of dense forest helped them to maintain an active life and good health. They entirely depended upon the forest for food and medicine. Forest products like honey, tubers, fruits, etc., were ideal for good health and were free from adulteration and food pollution.

On passage of time, changes have occurred in their habitat. A considerable influence of non-tribals from the plains into the forest has resulted in more contacts with the modern world and culture. Due to the deforestation and monoculture afforestation of forest in a large scale, the tribals inside the forest faced scarcity of food and medicinal plants. This forced them to seek food and medicine from outside world.

The tribals living in the fringe areas of forests have contacts with the non-tribals. So they became aware of the modern medicines and the welfare programs and activities of the Government and other voluntary agencies. This interaction with their outside world motivated the tribals and they gradually became aware of the modern system of medicine available in the Primary Health Centres of their locality.

The tribals began to use the food items available in the outside world also due to the shortage of food in the forest. This change of diet and interaction with outside world has led to the origin of a number of new diseases for which the TMPs have no

remedy. All these factors forced and motivated the tribals to experiment with modern medicine.

The acceptance of modern medicine does not mean that the tribals have lost all their faith in their traditional medical system. Rather they choose different systems of modern medicine available to them on a selective base. Their approach to the other systems of medicine is disease-specific. They still approach the tribal practitioner for some diseases while approaches other systems for many other disease. "The acceptance of modern medicine has not meant that traditional ideas of disease etiology have been superseded or that the cultural ramifications of specific illness have disappeared" (Mark 1981). Similar conclusions were also reached by Bharadwaj (1985) and Bhat (1976) in their studies.

Table 5A.16.1

District-wise number of subcentres, PHCs, CHCs per lakh rural population for Allopathy system:

Sl. No.	District	Total rural population	Subcentres		PHC		CHC	
			No. of sub centers	Sub centres Per Lakh	No. of PHCs	PHCs per lakh. pop	No. of CHCs	CHCs Per Lakh pop
	Kerala	**21,418,224**	**5,094**	**23.78**	**895**	**4.17**	**45**	**.21**
1.	Kasargod	895,282	205	22.89	48	5.36	2	.22
2.	Kannur	1,106,251	352	31.81	71	6.41	3	.27
3.	Wayanad	649,179	204	31.42	30	4.62	3	.46
4.	Kozhikode	1,615,444	389	24.08	66	4.08	6	0.37
5.	Malappuram	2,813,876	508	18.05	91	3.23	4	0.14
6.	Palakkad	2,007,658	471	23.46	79	3.93	3	0.14
7.	Thrissur	2,017,095	492	24.39	79	3.91	3	0.14
8.	Ernakulam	1,444,059	351	24.30	76	5.26	4	.27
9.	Idukki	1,027,185	231	22.48	56	5.45	2	0.19
10.	Kottayam	1,507,353	359	23.81	55	3.64	2	0.13
11.	Alappuzha	1,391,607	368	26.44	64	4.59	2	0.14
12.	Pathanamthitta	1,033,298	260	25.16	43	4.16	2	0.19
13.	Kollam	1,961,530	449	22.89	62	3.16	4	0.20
14.	Thiruvananthapuram	1,948,407	455	23.35	75	3.84	5	0.25

(Source : South Indian Human Development Report)

The factors influencing the selection of a system of medicine for a particular disease were studied. Table 5A.16.1 explicates the availability of modern medicine in different districts of Kerala.

Table 5A.16.1 reveals that sufficient facility of modern medicine is available to the rural population of Kerala. But even with these allopathic facilities in their area, it often could not satisfy all the needs of the tribals. Their approach to modern

medicine is mainly disease specific. Age, economic status, isolation from non-tribals, spatial mobility, sex, education, etc., are some other factors influencing the selection of the system of medicine.

It is concluded that the tribal medicine in Kerala has not lost its charm among the tribals. At the same time the number of non-tribals using the tribal medicine is showing an increasing trend. It was against this background, that the influences of modern medicine on TMPs were studied.

5A.16.2 Influence of modern medicine on TMPs

In the past, the TMPs dealt with all illness situations and the tribals had no other options except the tribal medicine. But today they have many options of modern allopathic system. So their approach to the TMPs is disease specific. At the same time TMPs are faced with the difficulties of curing the occurance of new diseases.

The present study revealed that the TMPs are least bothered about modern medicine. None of the TMPs, have paid a visit to any of the centres of modern allopathic medicine either for treatment or for seeking help or advice from them. On the other hand many claimed that professionals of allopathic and ayurveda systems had approached them to know about the ingredients of their curing recipes. Many had stayed with them to collect the secret of their successful medicine to some particular diseases like asthma, migraine, etc. But the TMPs never disclosed the details to them.

In the study 14 out of the 30 TMPs claimed that they had miraculously cured some diseases including the chronic diseases, which were not amenable to treatment and cure by the modern systems of medicine. Certain TMPs claimed that they possessed medicines for certain modern diseases like aids, cancer etc. The validity of these claims were not tested in the study as this did not come under the purview of the study.

5A.17 Factors that influenced the selection of the profession

The TMPs were asked to list the factors that have influenced them to select this profession. It was found that 18 (30%) out of the 30 TMPs studied had chosen this profession to keep the tradition of their family and 4 (13.33%) of them had chosen because of their interest in this profession and also because of the social acceptance of the profession. All these persons had got an exposure to the system of medicine from childhood onwards. This provided an opportunity for them to observe the system carefully and thus an interest had developed towards this system of medicine. The various reasons for the selection of the profession of a Tribal medicine practitioner are discussed in Table 5A.17.1.

Table 5A.17.1

Reasons for selection of the profession of TMP

Sl. No.	Reasons for the selection of the profession	No. of Practitioners	Percentage
1.	To maintain family tradition	18	60.00
2.	Interest in the profession/social acceptance of this profession	4	13.33
3.	To render service to the suffering people	3	10.00
4.	Monetary benefit	2	06.66
5.	Can't say/ Don't know	3	10.00
	Total	30	100.00

Table 5.A.17.1 reveals that the family bond is so strong that it has influenced 60 percent of the practitioners in selecting this profession. So the tribals pay much importance on preservation of knowledge. It deserves special mention that only 6.66 percent have taken this profession for pecuniary reasons. 10 percent have selected this profession to render service to the community.

5A.18 Pecuniary interest among TMPs

Majority of the TMPs believe that demanding money for medicine and the service rendered will invite the wrath of Gods and He will annihilate their medicinal knowledge and there after the medicine given by them will be devoid of curative effect. With this strong belief in mind, the TMPs will not demand any consulting fee or reward for their medicine and services. They gladly accept whatever the user offers as

remuneration. Normally the offered amount ranges between Rs. 25 to Rs. 100. This includes the cost of medicine and consulting fee as in the modern sense. Some of the TMPs admitted that the amount offered by some users are hardly sufficient even to meet the mechanical labour involved in the preparation of medicine given to them. But some persons who experimented all other systems of medicine but have lost all hopes of curing the chronic disease may get cure or relief to their illness in the tribal medicine. Overjoyed by this, such persons may sometimes offer big amounts like thousand rupees or even more at the end of the treatment.

It was noticed that 27 TMPs (90%) are still not demanding money and accept whatever the user pays. But three practitioners who are relatively of younger ages finds no fault in demanding money for their medicine.

5A.19 General observations made about TMPs

Some general observations made about the TMPs are given below.

5A.19.1 Family status

All the TMPs who cooperated with the study were married and were leading family life.

5A.19.2 Literacy level

90 percent of the TMPs (27 out of 30 TMPs) were literate, which is more or less equal to the literacy rate of Kerala.

5A.19.3 Food pattern

In the past the diet of tribals consisted mainly of tubers, fruits, green leaves, fresh vegetables, honey, fish, flesh of hunted wild available freely from the forest etc. They also have some cultivations like ragi and paddy in the forest area. But due to deforestation and new encroachers, the forest is now devoid of some of the above items and they are also facing scarcity of their traditional food items. Their present diet consists of rice, tapioca, ragi and other food items like bread, biscuits, etc. Purchased from the market and from the rationshops. But many of these items are adultered and of poor quality.

Since the practitioners are also in the tribal community, their food pattern has also changed as described above. It is noted that some TMPs are very particular in eating only the flesh of wild they themselves hunted on selective days. Many of them use vegetarian and non-vegetarian food.

5A.19.4 Faith in God

All of the TMPs in the study had a strong faith in God. They pray to the God for speedy recovery of their patients before giving medicine to them and many of the TMPs have a separate room for worship. Ladies are not allowed to enter the worship room in the house during their menstrual period.

5A.19.5 Case sheet of users

No TMPs are maintaining a case sheet or any other records of the user, such as name of the disease diagnosed, its severity, medicine given, dosage, etc. This has many disadvantages. For example, when a user visits the TMP for the second time, the practitioner would have forgotten many details of his earlier prescription and severity assessed from the first visit. But on the other hand this seems not necessary as many medicines are single plant single dose ones.

5A.19.6 Personal hygiene

It is noticed that all the TMPs kept their body and clothes clean while in their hamlet. The house and surroundings are always kept clean. The majority of the houses of the TMPs are built on a raised rectangular mudfloor, with wall made of bamboo poles, rubble and mud and roof made of wooden poles and thatched with either wild grass or bamboo leaves. The floor is plastered with mud or cowdung and these houses lacked in area. But the house of some TMPs have modern facilities. For example, the house of Appachan Vaidyan in Wayand is an electrified spacious, tiled building with radio, television working on dish antenna etc., and a separate concrete building is also situated adjacent to his house in which the dispensary and consulting rooms are situated.

5A.19.7 Physical fitness

Physical fitness is a highly complex phenomenon. It is the ability to carry out daily tasks with vigour and alertness without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforseen emergencies. The essential components of physical fitness are strength, cardio-respiratory endurance, flexibility agility, speed and balance (Gakhar and Martik, 1999). It is noticeable that the tribals who are living in a harsh environment could manage to maintain good health and lead an active life with the help of their own medical practices and cultural etiquette. Their religious beliefs, cultural values and customs help them to regulate their activities and to exploit the resources from their environment without tilting its ecological balance.

It was observed that almost all the TMPs, even the aged ones looked reasonably healthy. They carryout their own daily tasks without anybody's assistance. They go inside the forest for collection of medicinal plants and posses reasonable vision and memory but some of them have some general weakness due to old age. They depend on their own medicine. They claimed that they have never consulted any practitioners of modern medicine.

5B Analysis of the data collected from TMUs

The data collected from the TMUs were first analysed to obtain their socio economic background. Besides this, the analysis mainly focused to assess the attitude of the users towards tribal medicine. The attitude of the users were taken into account as the survival of the system mainly depends upon the opinion and experience of its users.

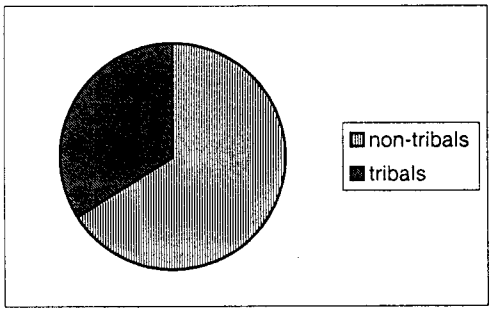
5B.1 Gender in users

It was found that majority of the users of tribal medicine are males. 74 out of the 100 users were males, remaining 26 users were females.

5B.2 Tribal, non-tribal distribution of users

Figure 5B.1

Pie-diagram showing the details of the Tribal, non-tribal users



Nearly two third of the users of Tribal medicine were non-tribals. In a total of 100 users, 66 were non-tribals and 34 were tribals. This indicates the acceptance of tribal medicine among the non-tribals.

5B.3 Age–wise distribution of users

Table 5B.3.1 explains the age-wise distribution of TMUs.

Table 5B.3.1
Age-wise distribution of users

Age	No. of Users
Below 20	Nil
20-29	13
30-39	25
40-49	24
50-59	22
60-69	10
70-79	6
Total	100

Table 5B.3.1 shows that 71 percent of the TMUs comes in the age group of 30-59 and no user below 20 years was found. From the table it can be understood that 38 percent are above 50 years of age. The mean age of a tribal medicine user calculated from the table 5B.3.1 is 45 years and percentage of TMUs above fifty years is 38 percent.

The mode value calculated from the table is 39 years (nearly) and the first four central moments are $\mu_1 = 0$ and $\mu_2 = 1.922$, $\mu_3 = 0.83$, $\mu_4 = 8.618$.

Coefficient of skewness $\beta_1 = \frac{\mu_3^2}{\mu_2^3} = 0.97$ and

Coefficient of Kurtosis is $\beta_2 = \frac{\mu_4}{\mu_2^2} = 2.33$.

The age distribution of tribal medicine users shows a slight positive skewness. More precisely people above 39 years old show more affinity towards the tribal medicine.

5B.4 Occupational pattern of the users

Table 5B.4.1

Occupational pattern of users

Occupation	No. of Users
Wage earners	38
Agriculture	19
House wives	11
Traders/small business men	22
Government servants	7
Others	3
Total	100

Table 5B.4.1 reflects the occupation-wise structure of the tribal medicine users. It is clear that 38 percent of the users are wage earners while 22 percent are small businessmen or traders. Agriculturists constitute 19 percent of the users. Housewives and government servants are 11 percent and 7 percent respectively.

5B.5 Educational qualifications of the users

The details obtained from the educational qualification-wise study of the users are illustrated in table 5B.5.1.

Table 5B.5.1

Education-wise distribution of users

Educational Qualification	No. of users
Illiterate	13
Upto primary level	31
Above primary and upto high school level	33
Above high school level and upto graduation	19
Post graduation	4
Total	100

From table 5B.5.1 it is obvious that 13 percent of the users of tribal medicine are illiterate. When compared with the literacy rate of Kerala one can infer that the illiteracy rate of this sample (13%) more or less coincides with that of the illiteracy rate

of Kerala (10.4%). It can also be inferred that 64 percent of the users have education upto highschool level. Significantly 19 percent of the users are graduates and 4 percent have post graduate qualification.

5B.6. Income-wise structure of the users

The monthly income-wise structure of the users is depicted in Table 5B.6.1.

Table 5B.6.1

Income-wise structure of the users

Income (Rs)	No. of users
Below 1000	46
1001- 3000	34
3001 – 5000	13
above 5000	7
Total	100

Table 5B.6.1 shows that 46 percent of the users have monthly income below Rupees 1000. However, 34 percent of the users have income between Rupees 1000 and 3000. The average per capita income of Kerala during the year 92-3 at 1980-1 price is only Rs. 1908 (NCAER, 2001).

5B.7 Attitude of the users towards tribal medicine

It was attempted to assess the attitude of the users towards tribal medicine. For this purpose four factors, which were likely to affect or reflect the attitude of the user towards the tribal medicine were identified as follows. In these, the first, second and fourth factors are objective in nature while the third factor is subjective.

1. Curative effect of the medicine (as assessed by the user from his own experience).

2. Expense incurred during treatment.

3. Convenience with regard to accessibility and availability of the practitioners and cultural barriers existing if any, like communication and interaction difficulties arising due to the dialectal differences of the tribal practitioners.

4. Side effects occurred if any.

Firstly the users were asked to record his /her opinion about the result of the treatment in a three point scale as completely cured, partly cured or not cured.

Secondly they were asked to consider all the four factors together and then judge their preference of the system of medicine on another three-point scale as fully satisfied, partly satisfied and not satisfied.

The result of the first set of observations will be an indicator of the curative effect of tribal medicine as experienced by the user and is shown as table 5B.7.1 while the second will reflect their evaluation of the system of tribal medicine as a whole and is illustrated as table 5.B.7.2.

Table 5B.7.1

Curative effect of medicines used

Opinion	No. of users
Completely cured	63
Partly cured	34
Not cured	3
Total	100

Table 5B.7.2

Opinion about tribal medical system

Opinion	No. of users
Fully satisfied	65
Partly satisfied	30
Not satisfied	5
Total	100

A comparison between the tables 5B.7.1 and 5B.7.2 reveals that few patients, even though their disease was not completely cured by tribal medicine, they are fully satisfied with tribal medicinal system as a whole. The reason can be attributed to some of the positive aspects they perceived from the factors listed 1 to 4 in this section. For all further cross analysis table 5B.7.1 and 5B.7.2 were used .

5B. 7.1 Education-wise attitude of the user

The users were studied to know whether their educational qualification has influenced their attitude towards tribal medicine. The details are set out as table 5B.7.1.1.

Table 5 B. 7.1.1

Education wise attitude of users

Education	Attitude			Total
	Fully satisfied	Partly satisfied	Not satisfied	
Illiterate	7	6	0	13
Primary	25	6	0	31
High School	13	15	5	33
Graduation	17	2	0	19
Post Graduation	3	1	0	4
Total	65	30	5	100

Here the calculated value of χ^2 = 21.795 and the tabled value of χ^2_{α} at 5% l.s. and 8 d.f. is 15.5073. As $\chi^2 > \chi^2_{\alpha}$, the calculated value of χ^2 significant. So there is association between the education level of a user and the attitude towards tribal medicine. However the association seems to be weak, since Karl Pearson's coefficient of mean-square contingency $= \sqrt{\frac{\chi^2}{N+\chi^2}} = \sqrt{\frac{21.795}{100+21.795}} = .423$

5B.7.2 Occupation-wise Attitude

An occupation-wise analysis of the users was made to determine their attitude towards tribal medicine and the result is illustrated in table 5B.7.2.1 given below.

Table 5B.7.2.1

Occupation-wise attitude of users

Occupation	Attitude			Total
	Fully satisfied	Partly satisfied	Not satisfied	
Wage earners	30	8	0	38
Agriculture	10	9	0	19
House wives	5	3	3	11
Traders/Small businessman	13	9	0	22
Government servants	5	0	2	7
Others	2	1	0	3
Total	65	30	5	100

Calculated value of $\chi^2 = 14.86$ and tabled value of χ^2_α at 5% l.s. and 10 d.f is 18.3070. Here $\chi^2 < \chi^2_\alpha$, value of χ^2 is not significant. Hence there is no association between the occupation and the attitude of the user.

5B.7.3 Income-wise attitude of the user

Income-wise attitude of the users towards tribal medicine was studied and the result is tabulated in table 5B.7.3.1, which helps to gauge the influence of monthly income on the attitude of the user towards the tribal medicine.

Table 5B.7.3.1

Income-wise attitude of the users

Monthly Income	Attitude			Total
	Fully satisfied	Partly satisfied	Not satisfied	
Below 1000	31	13	2	46
1001 – 3000	23	10	1	34
3001 – 5000	8	3	2	13
5001 and above	3	4	0	7
Total	65	30	5	100

The calculated value of $\chi^2 = 5.107$ and the tabled value of χ^2_α at 5% l.s. and 6 d.f. is 12.5916. As $\chi^2 < \chi^2_\alpha$, the value of χ^2 is not significant. Hence there is no association between the two attributes, income of the users and the attitude towards the tribal medicine.

5B.7.4 Age-wise attitude of the user

An attempt was done to assess whether there is an age-wise preference towards tribal medicine and the findings are shown in Table 5B.7.4.1.

Table 5B.7.4.1

Age-wise attitude of the users

Age	Fully satisfied	Partly satisfied	Not satisfied	Total
Below 20	0	0	0	Nil
20 – 29	12	1	0	13
30 – 39	20	5	0	25
40 – 49	14	10	0	24
50 – 59	11	11	0	22
60 – 69	5	2	3	10
70 – 79	3	1	2	6
Total	65	30	5	100

The calculated value of χ^2 = 21.855 and the tabled value of χ^2_α at 5% l.s. and 10 d.f. is 18.3070. As $\chi^2 > \chi^2_\alpha$, the value of χ^2 is significant. So there is an age-wise association towards tribal medicine. Here also the association seems to be weak since Karl Pearson's coefficient of mean-square contingency $= \sqrt{\frac{\chi^2}{N+\chi^2}} = \sqrt{\frac{21.855}{100+21.855}} = .42$

5B.8 Approach of users

Eventhough the TMPs are treating all diseases, they hold very effective treatment for some particular diseases for which there are more number of users than for other diseases. So an attempt was made in this direction and ć table 5B.8.1 presents the name of the disease for which the user approaches the practitioner and the results of the treatment in a three-point scale as completely cured, partly cured or not cured.

Table 5B.8.1

Disease-wise approach of users

Sl.No	Name of disease	Completely cured	Partly cured	Not cured	Total
1.	Head ache/ Migraine	21 (84%)	4(16%)	0	25
2.	Back pain/ Bodypain/ neckpain etc	14 (58.3%)	7 (29.1%)	3 (12.5%)	24
3.	Jaundice	13 (100%)	0	0	13
4.	Arthritis	2 (33.3%)	4 (66.6%)	0	6
5.	Piles	0	4 (100)	0	4
6.	Asthma	0	4 (100%)	0	4
7.	Chest pain	0	4 (100%)	0	4
8.	Diabetics	2(66.6%)	1 (33.3%)	0	3
9.	Skin diseases	1 (33.3%)	2 (66.6%)	0	3
10.	Kidney stone	2 (66.6%)	1 (33.3%)	0	3
11.	Ulcer	1 (50%)	1 (50%)	0	2
12.	White discharge	2 (100%)	0	0	2
13.	B.P.	1 (50%)	1 (50%)	0	2
14.	Burns/wounds	2 (100%)	0	0	2
15.	Epilepsy	0	1 (100%)	0	1
16.	Stomach pain	1(100%)	0	0	1
17.	Leg Fracture	1 (100%)	0	0	1
	Total	63	34	3	100

Based on the table 5B.8.1, the following analysis were made.

5B.8.1 Disease-wise

From table 5B.8.1 it is clear that majority of the users (25%) approach a tribal practitioner with a complaint of headache/migraine. Backpain or bodypain complaint comes next to this (24%). Thirdly comes jaundice (13%). Arthrites (6%) and ailments like piles, asthma, and chest pain are 4 percent each.

5B.8.2 Disease–wise result of the treatment

Using table 5B.8.1 an empirical approach has been made to assess the curative effect of the tribal medicine for some diseases. Table 5B.8.1 reflects that 84 percent of the headache/migraine complaints are completely cured and remaining 16 percent are partly cured. So it can be concluded that every patient with headache/migraine complaints get some cure in the tribal medicine.

58.3 percent of the backpain /body pain complaints etc., are completely cured while 29.1 percent are partly cured. Only 12.5 percent get no relief. All jaundice patients are completely cured. One third of arthritis cases are completely cured and the remaining two third gets partial relief. Piles, asthma, chest pain complaints are only partly cured. Since the number of users to other diseases are few no further analysis was made.

Arriving at a final conclusion about the curative efficacy of a medicine for a particular disease on the basis of the opinion of the users of the medicine may not be scientific and objective. However this can definitely throw some light about the diseases, which are amenable to the tribal medicine.

5B.9 Mode of approach of users towards tribal medicine

As explained in 5A.16.1 many tribals are now using modern medicine besides their tribal medicine. At the same time, today many non-tribals are using tribal medicine in a selective manner. Many patients first approach a system of medicine and switch over to the other without getting cure or relief from the first system. But the selection pattern for tribals and non-tribals are different. In the present study the details collected about the mode of approach of users for the particular disease at the time of interview are illustrated in Table 5B.9.1.

Table 5B.9.1

Mode of approach of users towards tribal medicine

Approach / Users	Direct approach	After experimenting other systems	Total
Tribal	15 (44%)	19 (56%)	34
Non – tribal	4 (6%)	62 (94%)	66
Total	19	81	100

Table 5B.9.1 reflects the approach of tribals and non-tribals separately. Contrary to expectation it was found that only 44% of the tribals have directly approached the tribal practitioner for the particular disease at the time of data collection and more than half (56%) of the tribals, had approached other systems of medicine, mainly allopathic medicine before coming to the tribal medicine. In the case of non-tribals only 4 percent of users are directly approaching the tribal practitioner while 94 percent are approaching the tribal practitioner after experimenting other systems of medicine.

5B.10 Source of information about tribal medicine

The source of information about tribal medicine was analyzed and it was found that, out of 66 non-tribal users, 60 of them (91%) were motivated to experience tribal medicine because of the advice of the satisfied users. Only 6 of them gathered information about the efficiency of tribal medicine from other sources like newspaper, reports, seminars, camps etc.

SUMMARY ,CONCLUSIONS AND POLICY IMPLICATIONS

Asha B. “A study of the application of information technology in tribal medicine in Kerala with regard to forest medicinal plants ” Thesis. Department of Library and Information Science ,University of Calicut, 2002

Chapter VI

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

6.1 The statement of the problem

The study is entitled "A study of the application of Information Technology in tribal medicine in Kerala with regard to forest medicinal plants".

6.2 Objectives of the study

1. To study the present status of the tribal medicine practices in Kerala.
2. To study the nature of collection of forest medicinal plants and the methods of preparation of medicines.
3. To examine the potentiality of Information Technology applications in tribal medicine for modernizing the tribal medical system for a wider applicability.

6.3 Hypotheses of the study

The study tested the following hypotheses.

1. Tribal medicine practices in Kerala is getting general acceptance and is maintaining a steady growth.
2. Tribal medicines have a greater relevance in the modern context.

3. Information Technology can be applied in tribal medicine for its modernization with a view of achieving wider recognition even at the global level.

6.4 Methodology in brief

The general nature of the present study was empirical. Data has been generated from the field study. Since the population of the study was large, sample study was conducted. Earnest effort has been made to take a representative sample from the population.

After considering the relevant characteristics of the population, the geographical area consisting of the three revenue districts of Kerala, viz., Wayanad, Idukki and Thiruvanathapuram were selected for the study purpose. After a complete enumeration of this study area, 30 tribal medical practitioners were identified. 100 clients (users) of these practitioners were selected in two different ways. Half of them (50 users) were selected by circular systematic sampling from the address record of the users maintained by some practitioners (10 in number) and the other half (50 users) from the clients of the remaining practitioners (20 in number) on spot selection by a Simple Random Sample With Replacement (SRSWS) technique by interviewing the users immediately after their visit to the TMPs. Interview has been conducted by the researcher itself. Data collected from the practitioners and users were separately analysed with appropriate statistical techniques. Observations made during the field study were also interpreted with the help of relevant studies.

6.5 Important findings

6.5A Tribal medical practitioners

6.5A.1 Socio–economic background

From the study it was found that the tribal medical profession in Kerala is dominated by males. Female presence is only 7 percent. The mean age of practitioner is 64 years. 90 percent of the practitioners were literate and 46 percent of the practitioners have monthly income below Rs. 2000. Wide variation in income earned from the profession was noted.

6.5A.2 Old population

The tribal medical practitioner's population is relatively an old population with nearly 43 percent of the practitioners are above 70 years. Significantly it was noted that these practitioners have already crossed 69.5 years, the average expected life in Kerala.

6.5A.3 Loss of knowledge

As already mentioned, the knowledge in tribal medicine is not recorded anywhere and is transferred from generation to generation by word of mouth. During this transferring process, there is an inevitable loss of considerable amount of knowledge. The same has been clearly revealed from this study. Table 5A.4.1 shows that 17 practitioners have so far transferred only a part of their knowledge and 2 practitioners have no sishyas or disciples to transfer their knowledge.

So 19 practitioners (63.33%) has not so far fully transferred their knowledge, when this is compared with the fact that 43 percent have already crossed their expected life (in other words, only 57 percent are below their expected life span), which indicates that atleast in some practitioner's case (6.36%), there is a greater probability of losing knowledge without being able to transfer it to their next generation. Another chance of the knowledge loss was also noted from the study. A practitioner usually transfers the valuable and secret knowledges at relatively old ages, by that time many will lose their vitality and memory power. This will also increase the rate of knowledge loss.

6.5A.4 Virtual extinction of the profession

Lack of motivation in the younger generation to initiate to this profession was noted in the study. All practitioners of this study were initiated to this profession before 28 years. But all tribal practitioners of the present study were above 30 years and no tribal practitioners of ages between 28 to 30 years were found. This shows a clear declining trend with regard to the transfer of knowledge to the younger generation. If this trend persists for a longer time, a virtual extinction of the group of practitioners is certain.

6.5A.5 Monopoly loses in the tribal society

Social recognition and prestige were the major rewards to the tribal practitioners in the past. They enjoyed the monopoly in handling the health problems of the tribal society. But with the introduction of modern medicine in the tribal belts,

the tribal practitioners lost their monopoly and influence in the society. This is one of the reason for the lack of motivation in younger generation to initiate to this profession.

6.5A.6 Remuneration

The tribal practitioners are not particular about the remuneration for their rendered service and are satisfied with whatever the patient gives. For many of them, the income earned from this profession is hardly sufficient to meet their family expenses. They generally believe that demanding remuneration for the service will destroy their medicinal knowledge. They find some other job for earning money, and treat this as a part-time profession. But this cannot be generalised. 10–20 percent of them are potential and influential practitioners who were able to attract large number of patients, income and social status. On an average there are seven patients per day per practitioner.

6.5A.7 Pedagogy

The tribal practitioners start on their profession at relatively younger ages as if they know the modern pedagogical principles. In modern pedagogy, it is a widely accepted fact that in order to maintain quality and skill in a profession, one should get trained at a young age.

The disciples acquire the knowledge and practices of medicine as an apprentice to the tribal practitioner by living and working with him. In many cases, the disciples will be a close blood relative of the practitioner. They identify the most potential disciple after continuous evaluation and assessment of all relevant aspects such as attitude and interest towards the profession, dedication, service mindedness, etc.

6.5A.8 Primitive methods

The diagnosing methods used in tribal medicine are primitive. If they have some experience in use of some modern methods, they can work wonders. For example, some tribal practitioners are excellent bone-setters, but in rare cases, the patient may get permanent disability after treatment. This can be avoided if they have some experience to utilise the X-ray methods. The tribal practitioners have no method to assess the severity of the disease. They always use freshly prepared medicine, which avoid the deterioration of their medicine from physical, chemical or biological effects.

There is no quality control and standardisation in the preparation of tribal medicine and no hard and fast rule to determine the dosage of medicine according to the severity of disease, age or body weight. In tribal medicine, the emphasis is on curative aspect rather than preventive aspect of disease.

6.5B. Tribal medicine users

6.5B.1. Socio-economic background

The study revealed that 74 percent of the users were males. Moreover 71 percent of the users were in the age group of 30-59 years. The mean age of the user was 45 years. Wage earners, agriculturists, traders or businessmen, constituted 38 percent, 19 percent, and 22 percent, respectively. 46 percent of the users have monthly income less than Rs. 1000. 13 percent of the users were illiterate and 4 percent are post-graduates. 31 percent has got only primary education.

6.5B.2 More non-tribal users

The tribal, non-tribal distribution showed that nearly two-third of the users are non-tribals, which clearly indicates the acceptance of tribal medicine in non-tribal areas. Today there is awareness in the modern society about the positive aspects of tribal medicine. This is mainly due to the proper coverages given by media about the scientific validation of many tribal medicine knowledge and also due to the efforts of KIRTADS and other such agencies.

6.5B.3 Curative aspect

The study revealed that diseases of the 63 percent of the users were completely cured and 34 percent partly cured while 3 percent not cured. The disease wise study showed that 84 percent [illegible] of the Headache/Migraine complaints and 58 percent of back-pain/body-pain/neck-pain complaints are completely cured while

16 percent and 29 percent are partly cured. All jaundice cases are completely cured. All piles complaints are only partly cured. 33 percent of the arthritis cases are completely cured, 67 percent are partly cured.

6.5B.4. Attitudes

Four factors, which were likely to affect or reflect the attitude of the users towards tribal medicine were identified as:

1. Opinion about curative aspect of the medicine.
2. Expense incurred.
3. Convenience and difficulties to access the system of medicine.
4. Side effects, if any.

The users were asked to consider all the above four factors and judge the system of medicine and to mark their preference on a three-point scale as fully satisfied, partly satisfied and not satisfied. 65 percent were fully satisfied, 30 percent partly satisfied and 5 percent were not satisfied.

Further statistical analysis with the help of chi-square test were made to know the income, occupation, age and education-wise attitude of the users towards tribal medicine.

The income and occupation-wise studies revealed that these characteristics were not associated with the attitude of the user.

The education and age-wise studies showed some association with the attitude of the user. Even though the users with high educational level such as graduation and post graduation are approaching tribal practitioners, people with lower education level showed a small dominance in the set of users. The age-wise study showed a slight positive skewness or more precisely people having more than 39 years old (mode value) has shown more affinity towards tribal medicine. However, both these associations were found to be weak, since the Karl Pearson's coefficients of mean-square contingency was small.

6.5B.5. Disease-wise approach

One-fourth of the users of the tribal medicine have headache or migraine complaint, 24 percent have back-pain/body-pain/neck-pain complaints, 6 percent are jaundice patients. Piles, asthma and chest pain patients were 4 percent each, while diabetic, skin-disease and kidney-stone patients were 3 percent each.

6.5B.6. Source of information about tribal medicine

91 percent of the non-tribal users become aware about the curative efficacy from the opinion of the satisfied user. 9 percent, from other sources like newspaper reports, camps, seminars, etc.

6.5C. Medicinal plants collection

All the practitioners preferred early morning time for collection of medicinal plants. They face some inconvenience from forest officers during collection of medicinal plants from the forest area.

6.6. Tenability of the hypotheses

In the light of the analysis of the data, the tenability of the hypotheses were examined.

6.6.1. Tenability of the first hypotheses

Now tribal medicine is not confined to the tribal people alone. In fact, it has more non-tribal users than tribal users. The study revealed that there is no occupation-wise or income-wise preference of users towards tribal medicine, which shows general acceptance of tribal medicine as far as these two characteristics are concerned. Even though the age-wise and education-wise analysis of the users showed some association, it was weak. Hence the tribal medicine practices in Kerala is getting general acceptance.

The lack of enthusiasm of the younger generation of the tribals to initiate to the profession of a tribal medical practitioner was revealed from the study. The study identified the possibility of the loss of tribal medicinal knowledge without being able to transfer to the next generation. Presently, tribal medicine is not maintaining a growth but shows signs of extinction or erosion at the knowledge level.

6.6.2. Tenability of the second hypothesis

User study revealed that tribal medicine has effective treatment for some of the chronic diseases like migraine, back-pain, arthritis, etc. Generally, chronic diseases can only be controlled and cannot be cured completely with modern allopathic drug therapies.

Patients who were not satisfied with the treatment of other systems of medicine are also found satisfied with tribal system of medicine. 'Less expensive' and 'no side-effect' were other attractions of tribal medicine besides its curative value. Tribal medicine has a greater relevance in the modern context for achieving the 'health for all' concept especially when the allopathic medicines are costly and having poisonous side effects.

6.6.3. Tenability of the third hypothesis

The study found that most of the existing methods of treatment in tribal medicine are primitive and crude ones especially in diagnosis, preparation of medicine and dosages.

Tribal medicine can achieve wider recognition by adopting modern methods in treatment and scientific validation of the tribal medicinal knowledge. Modern methods include, scientific diagnosis, standardisation and quality control of drugs, scientific determination of dosages, etc. The infinite capabilities of information

technology can be effectively used in modernising almost all the areas of tribal medicine.

Scientific validation of tribal medicinal knowledge is possible only through research and development. Here also, Information Technology can be applied for creating database of the scientifically validated knowledge, which will definitely invite inter and multi-disciplinary research.

6.7. Policy implication of the study

Kerala is blessed with rare species of medicinal plants possessing effective curative value and a number of tribal practitioners having valuable medicinal knowledge about these plants. If these natural resources are properly utilised and projected at global level with adequate legal framework to protect Intellectual Property Right (IPR) issues, Kerala can make tremendous development. It will create a number of job opportunities and can earn a lot of foreign exchange.

While making tribal medicine a tool for development, the Government must recognise the cultural, intellectual and commercial importance of tribal medicine. Government should safeguard the cultural heritage and background of the tribals and tribal medicine. Government should also enact proper legislation to protect the intellectual property right of the tribals. Thirdly, Government should tap the commercial potentiality of the trading of medicinal plants and the tourism aspects of the tribal surroundings. *Tribal Tourism Centres* - a centre where the natural beauty is

blended with tribal rejuvenation therapies like steam-bath (medicated bath), wild food, etc., is a new concept.

Appropriate health policy has to be formulated to integrate tribal medicine with modern medicine. On a broader plane, it could be said that the government has given all its patronage to the spread of Allopathic system of medicine. This approach has to be changed.

6.8. Strategies

6.8.1. Raising the social status and prestige

For attracting the younger generation of tribals towards the tribal medical practitioner's profession, steps should be taken to raise the social status and prestige of the profession. This can be achieved by:

a. Introducing tribal medicine as a part of the curricula in the tribal schools. It can be made as an optional subject for all other schools also.

b. Starting of tribal medical colleges (like that of siddha medical colleges) and appointing the potential tribal practitioners as tutors or professors.

c. Government should start some tribal medicine centers and dispensaries and appoint tribal practitioners as doctors and should take initiatives to produce potential tribal medicine drugs in a scientific way.

d. Proper identity certificates to all eligible practitioners should be given for enjoying some benefits and collection of medicinal plants from forest.

6.8.2. Integration and co-ordination of research

Government must link all research and development institutions like, Regional Research Laboratories (RRL), Tropical Botanical Garden and Research Institutes (TBGRI), etc., which are doing phytochemical studies. All research work in the areas of phytochemical studies should be integrated and coordinated for a speedy result.

6.8.3. Strategies for Information Technology application

Documentation of Knowledge

As mentioned earlier, the tribal knowledge of medicine is not recorded anywhere and it is scattered. A comprehensive collection, classification and documentation of all these knowledges is the first step to be taken to avoid further loss of knowledge and also to equip tribal medicine to make it convenient for application of Information Technology.

A special team of experts in Botany, Pharmacology, Phytochemistry and Anthropology, as well as legal experts with sufficient experience and knowledge in patent rights, trademarks and related issues has to be constituted for a comprehensive collection of the tribal medicinal knowledge through field-study, interview and other relevant methods.

On the basis of the ownership or possession of knowledge, tribal medicinal knowledge can be classified it into three categories as given below:

1. Individual knowledge kept as family secret from generation to generation.
2. Therapeutic recipes known to more than one healer of a tribe of a region.
3. Traditional knowledge known to the community members and tribal healers, which can be treated as community property.

While documenting the knowledge, the ownership of each knowledge has to be recorded to avoid future dispute about patent rights and sharing of monetory benefits if any generated from commercial exploitation of this knowledge.

There should be a separate authority to register this knowledge and he should act with the same powers and duties of a registrar of revenue documents/copyright controller as provided by the general law of intellectual property rights prevailing in the country. He should settle all future disputes about ownership and other matters.

After proper documentation and registration of tribal medicinal knowledge, information Technology can be effectively applied in tribal medicine in the following areas:

a. For encouraging research and development in this area

Create a database containing all the known details of a plant, such as its family name, botanical name, parts used for medicine, therapeutic action, indication, specific indication, contra indication, if any, dosage, botanical description, active constituents, phytochemical constants such as total ash, foreign organic matter, acid insoluble ash,

alcohol or water soluble extractives, etc. These details will encourage more researches towards the topic.

b. Encouraging plant trade

The potential world market of phyto-medicines or herbal medicines is very large. Supply is not sufficient to meet the demand. Tribal co-operative societies should be formed and some forest land has to be distributed to these societies for cultivation of medicinal plants. Large scale production of medicinal plants in these forest areas under the control of these tribal co-operative societies and marketing of these plants through Internet or web portals aimed singularly at international trade will definitely earn a lot of foreign exchange and generate employment opportunities.

c. Concept of tribal tourism centres

Tourism is the fastest growing and second largest industry in the world. It has tremendous potentials for earning foreign exchange, providing employment and development of backward regions.

Much of Kerala's exotic appeal is centered in the Western Ghats. The forest of Western Ghats are punctuated with small water-falls. Some of the scintillating cascades in the forest can be developed into tribal tourism centres. In these centres, tribal rejuvenation therapies like steam-bath (medicated bath) and wild food, tribal arts, crafts, music, etc., can attract tourists.

The potentiality of information technology can be used for marketing these tribal tourism centres through the creation of sites in the World Wide Web and other multimedia integration, which will generate income and employment opportunities for the tribals.

6.9. Suggestion for further research

Every country or state should utilize the natural resources for its overall development. Kerala has abundant natural resources in tribal medicine, which has unlimited potentialities. But unfortunately, no attempt has so far been made to explore these possibilities. It is hoped that this pioneer study will shed some light about this untapped natural resource of Kerala.

There is ample scope for a series of further research projects in this field by a team of experts in Information Technology professionals, Tribal medical practitioners and Information scientists.

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Appendix I

SCHEDULE FOR GATHERING INFORMATION FROM TRIBAL MEDIAL PRACTITIONERS

1. Name:
2. Age/Sex/Community/Family Status:
3. Address:
4. Years of experience in practicing tribal medicine:
5. How did you acquire the knowledge of practicing tribal medicine ?

   From whom ? When ?
6. How do you make a diagnosis of each disease of your patients ?

   What are the general cause of the diseases in your opinion ? Please explain each.
7. What are the diseases for which there is effective cure in your method of treatment ?
8. How many patients have been completely cured of their disease ?
9. Has there been any disease or patient not amenable to your method of treatment ?
10. Have you ever faced any difficulty in treating your patients ?

    If Yes, Please explain.

11. Has any miraculous curing happened to your treatment/administering of medicine ?

    If yes, please explain.

12. Briefly explain the method of collection of herbal plants and the process, if any, before administering them as medicine. Do you have any helpers for collection of medicine from forest ?

13. Do you find any difficulty in collecting the herbal medicine ?

14. A brief account of the preparation of medicine and the average, number of days it is stored.

15. Do you make any prayer or use mumbo-jumbo while administering the medicine to the patients ? Please explain.

16. Average monthly income earned by you from your treatment. Is it sufficient to meet your family needs ?

17. Do you have adopted disciples/students? If yes, how many ? If no, why ?

18. Have you transferred the secrets (if any) of your treatment to any one ? If yes, to whom ? If no, why ?

18.a. What is your treatment of the following ailments ?

1 Name of ailments	2 Remedy/ Medicine suggested	3 Herbs used/ preparation of each medicine	4 Dosage	5 Average No. of days required for treatment

b. Do you have any treatment for diseases like Aids, Cancer, Heart and Kidney diseases, etc.

19. Do you advice preventive medicine ?

Name of medicine Name of Disease Prevented

20. Have you sought any advice from the medical staff of PHC in respect of health ? If yes, how many times ? If no, why ?

21. Do you believe in evil spirit ? If yes, do you have any measure to protect persons from evil eye/evil spirit ? Please explain ?

22. Do you have any home remedy for any disease ? Please explain ?

23. Have you cured any disease where the modern medicine has failed/no remedy ? If yes, please give details of the disease and patient.

24. Do you think that seasonal change/climate change/time change affect the efficiency of your method of treatment ? Please explain.

25. Average number of patients visiting you per day ? Is it showing a decreasing or increasing trend ?

26. Do you have any suggestion for development of this system of medicine ?

27. Please explain your concept regarding health and disease.

Appendix II

SCHEDULE FOR GATHERING INFORMATION FROM TRIBAL MEDIAL USER

Part I

1. Name:
2. Age/Sex/Religion/Community:
3. Educational Qualification:
4. Income/Occupation/Place of habitation:
5. Address:

Part II

1. For what disease you approached the tribal medical practitioner ? How long the treatment lasted/expenditure incurred ?
2. Was it cured: completely/partly/not cured/has any side effect occurred ? Does the disease recurred after cure ?
3. Are you satisfied with the treatment you received from the tribal medical practitioner ? Mention your opinion as fully satisfied/partly satisfied/not satisfied after considering the following four aspects.
   a. Curative effect of the medicine as assessed from your experience.
   b. Expense incurred.

c. Conveniences with regard to accessibility and availability of the practitioner and cultural barriers existing it any, like communication and interaction difficulties arising due to the dialectal difference of the tribal practitioners.

d. Side effects.

4. Had you take any preventive medicine from tribal medicine practitioners ? If yes, is it effective ? Please explain.

5. Whether you approached the tribal medical practitioner for treatment directly or after trying other system of medicine such as Allopathy, Ayurveda, Homeopathy for the disease ? If yes, please explain.

6. Have you visited the nearby PHC in your place for treatment ? Of this disease, if yes, how many times ?

7. In your opinion what are the advantages of tribal medicine over other systems of medicine and your suggestion for the development of this system of medicine.

8. From whom you heard about this tribal practitioner ? Please explain.

Appendix III

LIST OF PRACTITIONER'S CONSULTED

1. Achappan Vaidyan,
   Valad P. O.,
   Thalapuzha,
   Wayanad 670644.

2. Aniyappan,
   Padikappu Kudi P. O.,
   Erumpupalam (via),
   Padikkappu,
   Idukki.

3. Appukuttan Vaidyan,
   Devaki Vilasom,
   Idanjam,
   Nedumangad,
   Trivandrum.

4. Arjunan Kani,
Kani Tribal Settlement,
Njaraneeli, Near Ikbal College,
Peringamal, Nedumangadu,
Trivandrum.

5. Basha,
Kappiset Colony,
Chettappalam P. O.,
Wayanadu.

6. Bhavan Kani,
Kala Bahvan,
Chathumkode,
Vithura (Trivandrum).

7. Bokki,
Eruppoodu Colony,
Padichira P. O.,
Wayanadu.

8. Bottan,
Onimoola,
Konnachan P. O.,
Erumadel, Wayanadu.

9. Chacli Vaidyan,
Karumathu Vayal,
Vazhavatta P. O.,
Wayanadu.

10. Chandu,
Kizhakkumpathu,
Poroor,
Wayanad.

11. Chellamma Mony,
Kandathil Veedu,
Thalamalikudi,
Korangatti P. O.,
Idukki.

12. Chellappan Kanivaidyan,
Tekkumkara Veedu,
Kani Tribal Settlement - Ilanjium,
Njara Neeli, Near Ikbal College,
Peringamala, (Nedumangadu), Trivandrum.

13. E. D. Annan,
Edathara,
Ambalakandy,
Valad P. O.,
Wayanadu.

14. Eachen Vaidyan,
Thadathurikattu Veedu,
Maruthwamala P. O.,
Vithura,
Trivandrum.

15. Ghathan,
Paingal Colony,
Kayoonni P. O.,
Wayanadu.

16. Gopalan Kany,
Aaloom Veedu,
Cherukarakunnu.

17. Govindan Kani,
Madathukonam,
Cherukara.

18. K. K. Annan,
Ayipoil House,
Kammana Post,
Mananthawady,
Wayanadu.

19. Kannan,
Nellara Colony,
Nellarachal P. O.,
Ambalavayal,
Wayanadu.

20. Karian Vaidyan,
Nambikolly,
Sulthan Batheri,
Wayanadu.

21. Karumpan,
Koloor Colony,
Muthanga P. O.,
Wayanadu.

22. Kunkan Vaidyan,
Wayngoor Veedu,
Munnam Mile,
Kuppady P. O.,
Wayanadu.

23. Lekshmikutty. K.,
Devi Bhavanam,
Mottamoodu (P. O.),
Kallar,
Vidhura 695 551, Trivandrum.

24. Mani Vellayan (Mooppan),
Chempaka Thottathil,
Veliyampara Settlement Area,
Mankulam P. O., Idukki.

25. Padmanabhan Vaidyan,
Vazhavatta House,
Vazhavatta P. O.,
Wayanadu.

26. Pandyan Kumaran,
Aamakandam Tribal Colony,
Annachal,
Chithirapuram P. O.,
Idukki.

27. Perumal Kani Vaidyan,
Thazhamon Purathu Veedu,
Njaraneeli,
Ilanjium P. O.,
Nedumangad, Trivandrum.

28. Raman Kumaran Vaidyan,
Tribal Colony, Mannankalm P. O.,
Chinnapparakudy, Idukki.

29. Sreedharan,
Chandrika Vilasom,
Ilanjium P. O.,
Nedumangad, Trivandrum.

30. Vellan,
Poomanal House,
Thirunelli Temple P. O.,
Mananthavadi, Wayanadu.

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