INDIGENOUS KNOWLEDGE OF HEALING AMONG THE TRIBES OF NILAMBUR VALLEY: A STUDY OF CROSS-CULTURAL LANDSCAPE ACROSS ETHNIC BOUNDARIES

A THESIS TO BE SUBMITTED TO

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DOCTOR OF PHILOSOPHY

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DECLARATION BY THE CANDIDATE

I declare that this thesis entitled "**Indigenous Knowledge of Healing Among the Tribes of Nilambur Valley: A Study of Cross-Cultural Landscape Across Ethnic Boundaries"** submitted for the award of Doctor of Philosophy to THE UNIVERSITY OF TRANS-DISCIPLINARY HEALTH SCIENCES AND TECHNOLOGY, Bengaluru, is my original work, conducted under the supervision of my guide **Prof. Sangeetha Menon** (and co-guide, **Prof. Vasant S. Shinde**.). I also wish to inform that no part of the research has been submitted for a degree or examination at any university. References, help and material obtained from other sources have been duly acknowledged

I hereby confirm the originality of the work and that there is no plagiarism in any part of the dissertation.

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CERTIFICATE

This is to certify that the work incorporated in this thesis "**Indigenous Knowledge of Healing Among the Tribes of Nilambur Valley: A Study of Cross-Cultural Landscape Across Ethnic Boundaries"** submitted by **Rakesh Kumar** was carried out under my supervision. No part of this thesis has been submitted for a degree or examination at any university. References, help and material obtained from other sources have been duly acknowledged. I hereby confirm the originality of the work and that there is no plagiarism in any part of the dissertation.

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List of Acronyms

A- Aranadan

ASC- Altered State of Consciousness

BST- Biostatistical Theory of Health

C- Cholanaickan

CoN- Capitalization of Nature

C-Wise -Community Wise Case Study

DPVTGs- Development of Particularly Vulnerable Tribal Groups

D-Wise- Disease Wise Case Study

ET-Epidemiological Transition

F- Female

FAMln- Family Affected by Malnutrition

FCA- Forest Conservation Act

FCFTM- Family collecting food by the traditional method

FGDs- Focus Group Discussion

HSC- Higher Secondary Certificate

HTH- Holistic Theory of Health

IDIs- In-depth interviews

IFA- Indian Forest Acts

IKH- indigenous knowledge of healing

ITDP- Integrated Tribal Development Project

K- Kattunaickan

KFD -Kerala Forest Department

KFDV- Kyasanur Forest Diseases Virus

LHT- Local Health Traditions

M- Male

NNFD- Nilambur North Forest Division

NSFD- Nilambur South Forest Division

NWFP- Non-wood Forest Product

IK- Indigenous Knowledge

P- Kattupaniyan/Paniyan

PDSs- Public Distributions Systems

PVTGs- Particularly Vulnerable Tribal Groups

P-Wise -Plant-Wise Case Study

SSC- Senior Secondary Certificate

STCs- Selected Tribal community of Nilambur Valley, Kerala

TMWoC- Total Main Workers in the Forestry Sector in the Community

TrO- Traditional Occupation

UNDP- United Nations Development Programme

WFA- Workers in Forest Area

WHO- World Health Organization

WNaS- Workers in Non-Agriculture Sectors

WPA- Wildlife Protection Act

Glossary

I. Cheerappu\Pani- Fever
II. Ubbukuthal\Thalakuthu\Thalavedana- Headache
III. (Pani And Kura\Kemmal)- Fever and Cough
IV. Virayalpani- Malaria
V. Oddabaruthu\Pallavedena- Stomach Ache
VI. Oddalukachathu\Chorathooral- Dysentery
VII. Oddavu\Erasalyam- Worm Infection
VIII. Pambukadi\Avumaddu- Snakebite
IX. (Penaykadi\Nayakadi)- Dog Bite
X. Murivu\Murioddu- Wounds
XI. Chekumaddu- Scorpion Sting
XII. Oddambal\Pallasthambhanam- Indigestion
XIII. Karalumthooralum- Cholera
XIV. Karal\Mesaddu- Vomiting
XV. Kanuubaruthu\Kannupazhuppu- Eye Infection
XVI. Alluvedana\Pallunoythechu- Toothache
XVII. Kevivedana\Chevivedana and Kevipazhuppu\Chevipazhuppu- Earache and Infection
XVIII. Pira- Temporary Shelters,
XIX. Kutti- Bamboo Pieces,
XX. Edippiyodu- Marriage Forceful Capture
XXI. Oppamaladu -Pre-Marriage Sexual Union
XXII. Maladiavam -Hill God
XXIII. Vilakkutamparati- Zoomorphic Spirits [Elephant (Anauru), Tiger (Puliuru) And Ox (Kalauru)]
XXIV. Chenmakkaran Or Moopan - Leader of the settlement or colony) who usually performs healing and other ceremonies among STCs. The moopan is the institutional head of the settlement and acts as a civic, political, judicial, and religious head (on a few occasions like during oracle practices) of the community. The post of moopan was hereditary but currently, the selection of moopan is based on age through the democratic process
XXV. Panam- Money
XXVI. Kalikaran -Coconut
XXVII. Daivamkandethathu - Trance or possession state and divulges the cause of his illness.
XXVIII. Kadu-Forest

XXIX. Nayaka- King

XXX. Mana -Mud-thatched roofs of single space without compartmentalization

XXXI. Mudali- Sometimes two to three settlements are also headed by the religious leader called Mudali.

XXXII. Nammilichi -Clan God

XXXIII. Nammaliedathi -Mariamma-Goodness of Smallpox

XXXIV. Vaalemude Ethan -Shiva

XXXV. Shimmalachi- Parvathi

XXXVI. Matanga -A Man of The Lowest Caste

XXXVII. Adivasi -Forest Dwellers

XXXVIII. Girijan -Mountain Dwellers

XXXIX. Pahari -Hill Dwellers

XL. Vanyajati –Forest Caste

XLI. Adimjati -Primitive Caste

XLII. Janajati -Loosely Translated as Caste

XLIII. Qabilawale -A Persian Term Vaguely Refiring Tribes

XLIV. Nadu-Rural

XLV. Alais -Rock Shelters

XLVI. Kottu-Digging Stick

XLVII. Kodali -Axe

XLVIII. Kuzhippara -A Stick with Iron Blade

XLIX. Chellu- Tick, Lice

L. Kurangu Pani- Monkey Fever

SYNOPSIS

The health and healthcare systems are a synthesis of various types of knowledge that include lived knowledge, experiential knowledge, and performed knowledge. In this perspective, the determinants of health are the body, history, and culture, which include beliefs, perceptions, behaviours, and worldviews. In India, the healthcare sector has a long-standing history of codified medicinal knowledge, such as Ayurveda and Siddha. However, in addition to the codified traditional medicine, several other traditional non-codified systems of medicine exist, which are regarded as the "folk sector" or “Local Health Traditions (LHT)”. This diverse healthcare system has become a subject of interest for researchers who are keen to understand the healthcare models of different communities and cultures.

This thesis focuses on one such non-codified knowledge tradition that is practiced by the tribal community of Nilambur valley, Kerala, India, specifically Cholanaickan (C), Kattunaickan(K), Kattupaniyan/Paniyan(P), and Aranadan (A). These communities are predominantly foraging communities, and their knowledge of health and healing is acutely embedded in their cultural practices, subsistence models, and lifestyle. The study examines various aspects of the STCs’ perception of health and healing practices and how the underlying systemic structure of healing functions and effectively delivers healthcare to its members in the absence of modern medicine. It also delves into the ethno-epistemology of Indigenous Knowledge of healing of Selected Tribal Communities in Nilambur, Kerala (STCs) and provides a theoretical understanding of the Indigenous model of healing.

Furthermore, the thesis highlights the characteristics of STCs healing knowledge, including the process of knowledge management, which includes knowledge acquisition, knowledge development and storage system, knowledge transmission, and distribution system. It also discusses the challenges associated with healing knowledge management, including the role of gender in this process.

The thesis also investigates the factors that lead to a change in lifestyle among STCs, such as the forced implementation of intensive development programs and policies. It discusses how unplanned intensive development can have a negative impact on STCs' health outcomes. This highlights the need for a more nuanced approach to development that takes into account the cultural practices, subsistence models, and lifestyles of STCs.

In conclusion, this study sheds light on the importance of Indigenous Knowledge of healing and traditional healthcare practices in providing healthcare to tribal communities. It provides a theoretical understanding of the Indigenous model of healing and highlights the challenges in knowledge management and transfer. The study underscores the need for a more inclusive approach to healthcare delivery that incorporates traditional healthcare practices, especially for communities that have a long-standing history of such practices. The study recommends that policymakers and healthcare professionals work together to incorporate traditional healthcare practices into modern healthcare systems to provide a more comprehensive approach to healthcare delivery.

List of Publications

Published

- Menon, Sangeetha, Menon, Meera, Kumar, Rakesh 2019. "Beyond Body–Mind: Self-narratives and Consciousness", Psychological Studies, Springer (Nature) https://doi.org/10.1007/s12646-019-00519 w
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- Kumar, Rakesh. 2021 'Polychronic knowledge of Health and Healthcare and Polythetic Culture : A Diachronic Perspective', International Journal of Scientific Research in Science and Technology, ISSN: 2395-6011 (Print), ISSN: 2395-602X (Online).
- Kumar, Rakesh 2022. "Why Is There a Need for an Alternative Onto-Epistemic Understanding of Health for Contemporary Hunter-Gatherers?", In Diversity in Archaeology: Proceedings of the Cambridge Annual Student Archaeology Conference 2020/2021, Oxford: Archaeopress, pp 163-174, ISBN:978-1-80327-281-8 (print book), 978-1-80327-282-5 (ebook)
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- Kumar, Rakesh. 2022. 'How the Health of Contemporary Hunter-gatherers Is a Victim of 'civic colonial' Policies and Politics?', History Today, *Preprint- SocArXiv. April 15. doi:10.31235/osf.io/sczmx.*
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ArXiv Reports:

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CHAPTER 1: INTRODUCTION

1.1 The Epistemology of Indigenous Knowledge of Healing

“We know more than we can tell” Michael Polanyi asserted in his book *The Tacit Dimensions* (Polanyi, 1966). Polanyi refers to such knowledge as tacit, as opposed to explicit knowledge, which can be written down, transmitted, and understood by a recipient (Polanyi, 1966). "Indigenous knowledge" is one example of Polanyi's tacit knowledge. However, the term indigenous is highly contested because of its ambiguous definition, which raises the question, "Aren't we all indigenous to the land where we were born?" Therefore, rather than limiting themselves to the term "indigenous knowledge," some scholars prefer terminology like "local knowledge," "traditional knowledge," and "folk knowledge" (Ackerknecht, 1946) (Cleetus, 2007) (Robbins & Dewar, 2011) (O'Connor & Hufford, 2001). Nevertheless, these terms are frequently used in an inexact and interchangeable manner to describe Indigenous epistemologies.

Indigenous knowledge has traditionally been discussed in terms of its non-linearity, dynamism, collectiveness, holistic nature, geo-contextuality, localization, adaptability, validity, competency, irreplaceability, intergenerational memory, and sustainability. Additionally, it is also important to note that indigenous knowledge has been described, either in comparison to western knowledge (for example, indigenous knowledge is culturally embedded and inextricably linked to the land) or through spatiotemporal concepts like historical knowledge, heritage, and community situated knowledge.

Indigenous knowledge is understood to be an intergenerational understanding and abilities that have been developed by a particular group of people in a particular geo-temporal setting and are collective, holistic, and adaptable (Mistry, 2009). It has a long temporal history and spatial association (Bruchac, 2014). However, due to vertical knowledge transfer, such as from a father to a son, it is occasionally interpreted as static knowledge, which means that the knowledge is the same as that of the previous generation and has not been updated or new knowledge has been added to the knowledge system. However, the vertical transfer of indigenous knowledge from one generation to another doesn’t imply that it is unconditionally static; it is dynamic;

instead, the knowledge modifies itself as a response to change or transition in community lifestyle and environment. The members of the community update their knowledge through a horizontal learning process i.e., learning from a peer group or fellow members from the same or different communities.

The indigenous knowledge of healing (IKH) is one example of indigenous knowledge. IKH consists of a set of shared values, beliefs, worldviews, experiences, and practices (Haque, Chowdhury, Shahjahan , & Harun , 2018) (Struthers, Eschiti, & Patchell , 2004). It also comprises lived, experiential and enacted knowledge, and its determinants are mind, body, spirit, ecology and socio-cultural practices. IKH is constituted locally and embedded in the practices, institutions, relations and rituals, and are essentially tacit and practised orally like other forms of indigenous knowledge. There are some unique and universal features of the IKH like the use of ecstasy, knowledge obtained during an Altered State of Consciousness (ASC), belief in the spirit and supernatural world, and healing through divination (Struthers, Eschiti, & Patchell , 2004). The inclusion of the aforementioned components prevents IKH from adhering to the principles and framework of the empiricist model of knowledge, which states that knowledge can only be acquired through physical senses, acknowledged as valid and objective through virtual experiences, obtained through method practise, and is free from belief (Kenny, 1986). As a result, there has always been a disagreement over how to classify IKH as a knowledge system or as a form of animistic religion (Vontress, 2005).

Therefore, to comprehend IKH, it is essential to first analyse Indigenous epistemology, which comprises three interacting worlds: the physical world (land, sky and living organisms), the human world (knowledge and approach to people, family rituals and capacity to change) and the sacred world (metaphysical and spiritual) (Foley , 2003). This implies that interconnectedness or wholeness is the fundamental concept upon which Indigenous philosophy is based. Even though different indigenous communities have different worldviews and belief systems, the triangulation of the three worlds is the fundamental and defining aspect of indigenous philosophy (Gélinas & Bouchard, 2014) (Hickey, 2020).

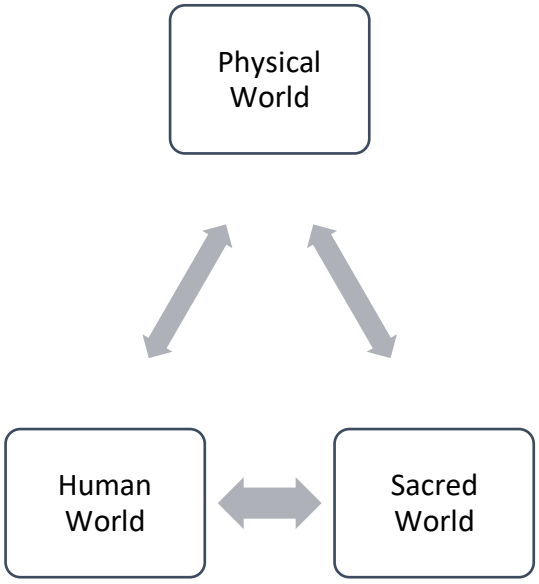

Figure 1 The three worlds of indigenous philosophy. The model of three interreacting worlds has been adapted from the Foley, D. (2003) article entitled 'Indigenous epistemology and Indigenous standpoint theory'

It is also explicit from the above discussion that IKH involves various dimensions of life (i.e. intellectual, physical, emotional and spiritual) and establishes a transpersonal relation also with the non-human organism (like- animals, plants, spirits, ghosts, ancestors and gods) for the perception of health and healing. In another word, IKH is a dynamic mixture of tradition and present intervention, which comprises native belief systems, empirical apprehension and worldviews. However, it is important to note that the physicalist and empiricist philosophies (to which modern science adheres) reject the third component, namely the sacred world, by declaring it unreal (Laughlin, 2013). In a nutshell, physicalist and empiricist philosophies negated both the knowledge and experience gained from the sacred world or in ASC, which is the core of IKH.

In other words, IKH consists of a set of common values, beliefs, worldviews, experiences, spirits, gods, ancestors and other supernatural or non-physical agents, which does not comply with the physicalist or naturalist philosophies. It is because, according to physicalist and naturalist philosophies, knowledge is defined as having properties such as objectivity, rationality, replicability and verifiability (Mazzocchi, 2006). The relationship between phenomena and knowledge should be based on a

testable hypothesis, and knowledge should include an explanation for the discovery and method (Mazzocchi, 2006).

It is important to note that the foundation of indigenous philosophy is rooted in the ongoing discussion of reality and cultural diversity. What is real? It is a debated subject in philosophy. Different schools of philosophy have interpreted reality differently. The idealist model contends that reality is fundamentally immaterial, in contrast to the physicalist and naturalist models, which locate reality in material things. The discussion on reality is not the subject of this research, therefore, it is not addressed here.

However, it is crucial to comprehend the binary concept developed by Laughlin (2013), i.e., monophasic culture and polyphasic culture, in order to contextualise the discussion on the epistemological foundation of indigenous knowledge of healing. According to him, monophasic culture rejects alternative states of consciousness such as dreams or trans-states as unreal and instead focuses on "adaptive interactions with the external physical world" (Laughlin, 2013). In contrast, polyphasic cultures (such as indigenous cultures) regard their ASC experiences as a different aspect of reality rather than unreal (Laughlin, 2013). Thus, the reality is not perceived in indigenous knowledge "on the basis of a linear view of cause and effect, but rather as a universe composed of continually generating multidimensional cycles in which all elements are part of an entangled and intricate web of relationships" (Mazzocchi, 2006).

Therefore, to understand and apricate the indigenous knowledge of healing (IKH), an in-depth understanding and exploration of indigenous epistemology and metaphysics are required.

1.2 Discussion on key terms

Numerous terms used in this study have parallel terms, including "hunter-gatherer community," "tribes," “indigenous people," "disease," "illness," and "sickness ", which may create confusion among the reader. In order to prevent this misunderstanding and confusion, it is imperative to define these terms and their implications.

1.2.1 Hunter-gatherers, tribes, and indigenous people

Who is a hunter-gathers? The hunter-gatherers are a group or sub-group of people whose primary subsistence strategy is a combination of hunting and fishing, as well as foraging for food. Hunting and gathering are regarded as the primary form of sustenance. It intertwines the people with their land (natural resources) and culture. Hunting-gathering methods of subsistence have been considered as the simplest form of economic subsistence and their production has been rendered as need-orientated means of production in which ecology itself functions as a storage (Hill, Baggio, Hurtado, & Boyd, 2014). This mode of sustenance practices started with the *Homo Erectus* in the last phase of the Pleistocene geological epoch (~2 million years ago) and is uninterruptedly functional in current times (Black, 1975) (Dunn F. L., 1968) (Cohen, 1989) (Boyden, 1970). It is important to note that this does not imply that current hunting and gathering practices are similar to those of the past.

Hunter-gatherer communities have low population densities and are mostly family-based subsistence units. In times of hardship or scarcity of natural resources, a group of families functions as a single unit for better resource management and subsistence activities (Armelagos, Brown, & Turner, 2005). They use mobility as a survival strategy, which could be one of the reasons for their nomadic lifestyle. However, modern hunter-gatherers sometimes combine foraging with agriculture and animal husbandry.

Hunter-gatherer communities are scattered around the globe. Due to their unique subsistence method, language, worldview, beliefs, and practices, it becomes very challenging to describe the status and needs of modern hunters and gatherers. According to Roger Blench (1999), modern hunter-gatherers' preferred subsistence strategy (hunting and gathering) directly conflicts with the conservation philosophies of contemporary governance (Blench, 1999).

With the colonial influx of the concept of genetic-cultural superiority, several braided stream terms for hunter-gatherer communities, such as tribes, first nations, ethnic groups, indigenous, and aboriginals, are coined. In ancient India, for example, no hunter-gatherer group was designated with a generic term that associates these groups

with a social category such as tribes, indigenous groups, or aboriginals, nor was there any vernacular equivalent for the aforementioned terms. Although terms such as *Vyadha/Lubdhaka, Pulinda, Vhabara, Vanechara, Akhetaka, Kirata* (in Mahabharata), and *Janas* (in Ramayana) can be found in ancient Sanskrit texts denoting forest hunters-gatherers/nomads. However, these were not used in the context of social categories. Numerous terms have developed over time, including *Matanga* (a man of the lowest caste), *Adivasi* (forest dwellers), *Girijan* (Mountain dwellers), *Pahari* (hill dwellers), *Vanyajati* (Forest caste), *Adimjati* (primitive caste), *Janajati* (loosely translated as caste) and *Qabilawale* (a Persian term vaguely refiring tribes) (Apte, 2020). However, the colonial government has complicated coexistence by dividing the people between tribes or indigenous groups and the general population.

Although "indigenous peoples" is a phrase that appears frequently in postcolonial literature, there are also alternative terms like "tribes," "first peoples/nations," "aboriginals," and "minority ethnic groups." As per estimation, around 370 million indigenous people are spread in 70 countries worldwide (Horton, 2016). No single definition can accommodate such a vast diversity. Therefore, scholars have outlined a few common characteristics of the Indigenous people which may and may not apply to all. The characteristics are as follows:

- The historical continuity of inhabitation over a specific geographical space or territory
- Self-identification as with a distinct name and exhibiting a strong sense of belonging or identity which is accepted by both the individual as well as the community
- Having a discrete belief system, language, religion and socio-cultural practices
- Politically autonomous (that is the tendency to manage their affair separate from the government) and economically self-sufficient

The criteria listed above show that the idea of indignity is dependent and can only be understood through terms like outsider, coloniser, dependency and autonomy.

The term ‘indigeneity’ even becomes more intricate one considers an individual's identity from the population rather than the population. It raises the question, "Aren't

we all native to the land where we were born?". In the Indian social hierarchical context, the question of individual indignity becomes exceptionally complicated because of the idea of caste: which is understood as a social hierarchy assigned to the individual at birth like indigeneity. Additionally, the indignity debate became more complex with F.G. Bailey's (1961) theory of "tribe-caste continuum", which substantiates the evidence that tribal society has both tribe and caste characteristics (Bailey, 1961).

Tribal ethnic groups are recognised as scheduled tribes under the terms of Clause 1 of Article 342 of the Indian Constitution, and the Indian government recognises "tribes" in the census as a distinct demographic category (NCST, 2005). The term "tribal," which originated as a colonial term, once had negative connotations of being primitive but is now widely accepted. In India, the term "adivasis," "tribes," and, more recently, "indigenous peoples" are widely used in different contexts and purposes. However, other terms are also used, such as Particularly Vulnerable Tribal Groups (PVTGs). The Indian government first identified the most vulnerable tribal groups in 1975, and they were given their own designation—PVTGs. The PVTGs are the tribal group with a pre-agriculture level of technology, a stagnant or declining population, extremely low literacy, and a subsistence level of the economy (Ministry of Tribal Affairs, 2019).

It is evident from the discussion above that there is no single definition or term to accommodate such a vast diversity of terms. As a result, the term "Selected Tribal Community of Nilambur, Kerala" is used to refer to the study population in this study. It has been abbreviated to "STCs" and used synonymously to distinguish it from the other indigenous community in the area.

1.2.2 The folk, traditional, local and indigenous health-care system

The Indian health-care system is exceedingly diverse, and it is enriched by a dynamic and prosperous medical plurality. The diversity of India's medical system is closely linked to its inherent plurality and long history of medical tradition. Dunn's (1976) classification of medical pluralism comprises *local medical systems*, such as folk medicine; *regional medical systems*, such as Ayurvedic, Unani, and Chinese systems; and *cosmopolitan medical* systems, such as Allopathy. In India, medical pluralism encompasses Ayurveda, Yoga, Unani, Siddha, Homeopathy medicinal systems (AYUSH), and the western medical system known as Allopathy. Over time, these

systems (AYUSH) became institutionalised and professionalised (Sujatha & Abraham, 2012) (Hardiman, 2009) (Priya, 2012). It also represents a tradition of codified, textual health knowledge systems (Khatri & Sinha, 2018). These institutionalised traditional systems could be categorised under Kleiman's classification as a "professional sector" in India (Kleinman, 1980). However, there are other traditional systems in the country besides the professionalised form of traditional medicine (Prasad, 2007) (Lambert, 2012) (Payyappallimana & Hariramamurthi, 2012). The non-codified systems that Kleinman refers to as the "folk sector" are included in the non-professionalised sector (Kleinman, 1980). These practices are increasingly being referred to as Local Health Traditions (LHT) in policy documents in India (GOI, 2002). LHT is an umbrella term for folk remedies, home remedies, and various tribal (indigenous) ethnic groups' medical systems (Payyappallimana & Hariramamurthi, 2012) (GOI, 2002). Non-codified medical systems are based on an oral tradition of learning and passing on knowledge (Khatri & Sinha, 2018).

In this study, the term 'indigenous knowledge of healing' is used to refer to the medicine practiced by the Selected Tribal community of Nilambur Valley, Kerala (STCs). It has been abbreviated to 'STCs' healing practices' and used synonymously to distinguish it from other traditional medicines of the AYUSH systems.

1.2.3 Disease, Illness and Sickness

Kenneth M Boyd (2000) used Professor Marshall Marinker's "three modes of unhealth" to distinguish between disease, illness, and sickness in his article titled "Disease, illness, sickness, health, healing and wholeness: exploring some elusive concepts" (Marinker, 1975) (Boyd , 2000). According to him, "Disease is the pathological process, deviation from a biological norm. Illness is the patient's experience of ill health, sometimes when no disease can be found. Sickness is the role negotiated with society" (Boyd , 2000). The research has used the above-mentioned castigation in this study to discuss the research findings. It's vital to note that because SCTs don't have comparable categorisation, the term "disease" and "illness" are used simultaneously and occasionally synonymously in this study to avoid the perplexity of terms.

1.3 Review of Literature

Indigenous healing has been studied from diverse perspectives, and there is a growing corpus of literature on the subject. This section of the chapter reviews relevant literature and discusses its relevance to this study by discussing previous studies' findings, evidence, and content. The review process takes a synthesis approach, in which previous research's conclusions or evidence, as well as their methodological approaches, are examined and linked to this specific study.

1.3.1 Literature Search Strategy

In the search for relevant literature (for the theme mentioned above), the researcher searched digital databases like Scopus database, Pub-MED, ArXivs pre-print databases (articles accepted for a peer-reviewed journal), JSTOR, Sodhganga, Special issues (using keyword), Google scholar database, Governments reports (on Indigenous health published by respective ministries), UNDP reports, WHO reports and other research institutes reports. The search was undertaken using keywords and a combination of keywords (example, Table 1). Boolean Operators "AND" and "OR" were used to combine search terms where appropriate (Alliant Libraries). The references of the reviewed articles are also cross-checked to identify the other eligible articles which may not have been captured during the database search. Fig. 2 outlines the literature review process for the article and Table 1 roughs out the search strategy.

SI. No.	Searches
1	tribes\ of\ Nilambur\ valley\ Kerala
2	Indigenous\ healing\ practices\ of\ tribes\ of\ Nilambur\ valley\ Kerala
3	tribes\ of\ Nilambur\ valley\ Kerala\ and\ health
4	tribes\ of\ Nilambur\ valley\ Kerala\ and\ healing practices
5	Cholanaickan\Kattunaickan\ Kattupaniyan\ Aranadan\ health\ and\ healing\ practices\
6	Hunter-gatherer /or indigenous lifestyle transition/ and heath vulnerability factors
7	Hunter-gatherer /or indigenous/settlement transition/ and health
8	Hunter-gatherer /or indigenous/subsistence/or diet transition/ and health

9	Hunter-gatherer /or indigenous/subsistence/or epidemiological transition/ and health
10	Hunter-gatherer/or indigenous people/ and developmental policies/ and /health

Table 1 Search strategy for literature review

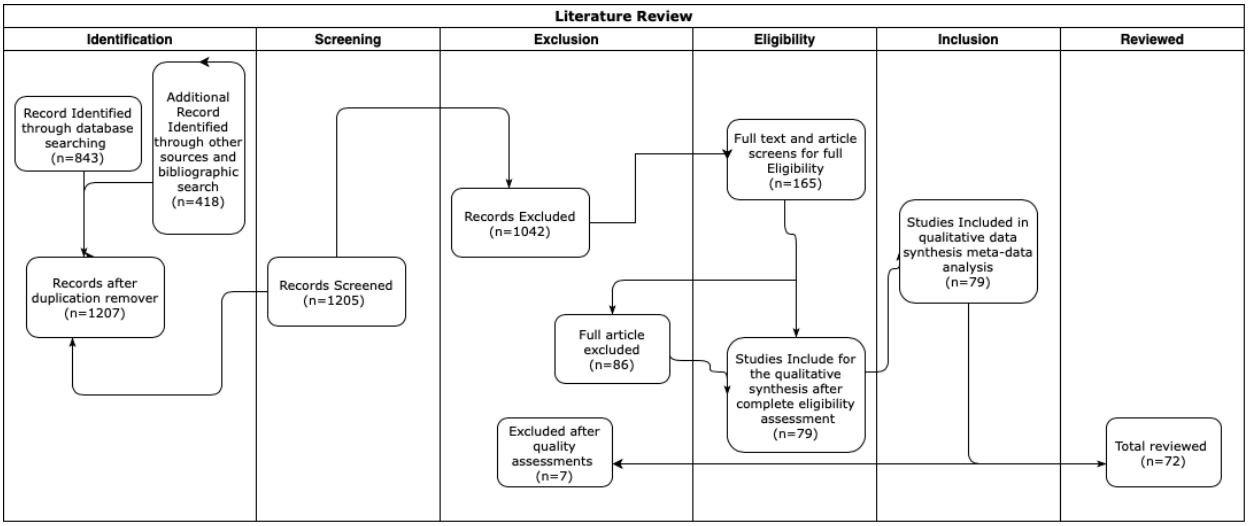

Figure 2 Study selection for scoping review process

1.3.1.1 Screening

All articles from the electronic search were extracted at Nvivo.10.6 and Zotero databases. The title and the abstract screening of the article were completed independently based on inclusion and exclusion criteria.

1.3.1.2 Study Inclusion Criteria

Both the qualitative and quantitative studies published in English in a peer-reviewed journal published reports, dissertations and thesis were included. Studies were included if they were a group or combination of the searches and completed text with supplementary data was available.

1.3.1.3 Study Exclusion Criteria

The studies that were excluded are conference proceedings, published in a non-English language, non-peer-reviewed journals, and commentaries.

1.3.2 Review of literature on the concept of healing and health

Healing has been defined and understood differently in various therapeutic practices. For example, biomedicine defines healing as a repairing, removing, or modifying process [11]; whereas Ayurveda defines healing as restoring balance, peace, and connection among *Doshas* (*Pitta, Kapha, Vata*) (Firth, et al., 2015); and Traditional Chinese Medicine defines healing as restoring the correct balance of *yin* and *yang* (Firth, et al., 2015). The issue of ambiguity in the definition of healing was also highlighted by Arthur Kleinman (1978) in his well-known article titled "*Concepts and a model for the comparison of medical systems as cultural systems*" (Kleinman, Concepts and a model for the comparison of medical systems as cultural systems. , 1978).

According to its etymology, the word "healing" derives from the old English word *hǣlan* which means "wholeness" (Quinn, 1997). what does "wholeness" mean? Is it a process or an experience? Is it a transformational or transcendental act? The concept of healing continues to be ambiguous and inexact because each field of knowledge defines it differently. Healing is described in functional terms as an activity of the profession of medicine in the western healthcare disciplines inspired by naturalist views (Starr, 1982). However, proponents of holistic perspectives define it in terms of experience: transcending suffering and transforming it into wholeness (McElliott, 2010).

Will a functional description of healing be adequate to describe the healing mechanism? Due to the complexity of the term "healing," any response to this question will be insufficient. However, in order to contextualise the healing debate in its proper historical and philosophical context, it is crucial to examine the various attributes associated with the concept of healing. In biomedicine, healing has been defined as the restoration of health from an unbalanced, diseased, damaged, or uninitialized organism (Egnew, 2005). Healing, according to this definition, is a relative term that can be understood through bodily or biological terms. Firth et al. (2015), on the other hand, identified four healing attributes after conducting concept analysis[1] and extensive literature reviews on healing. According to him, 'healing is a holistic, transformative

[1] Concept analysis is a method to examining concepts for a semantic structure [31]. The main purpose of concept analysis is to determine the defining attribute od the concepts under study.

process; it is personal; innate or naturally occurring; multidimensional; and it involves repair and recovery of mind, body, and spirit' (Firth, et al., 2015). Additionally, according to the research by Firth et al. (2015), healing is not a spontaneous phenomenon, but rather a necessity, requiring a case of deviation from one's previous state of being (positive sense). The deviation can occur at levels, i.e. micro (cellular) to macro (nation or global)[2]. In the philosophical term, the deviation can crop up at the level of body, mind or self/spirit (Firth, et al., 2015). Therefore, healing can have multiple dimensions: physical, mental, emotional, spiritual, social, communal, and environmental. The diagram (Fig. 3) concisely comprehends the complexities of healing.

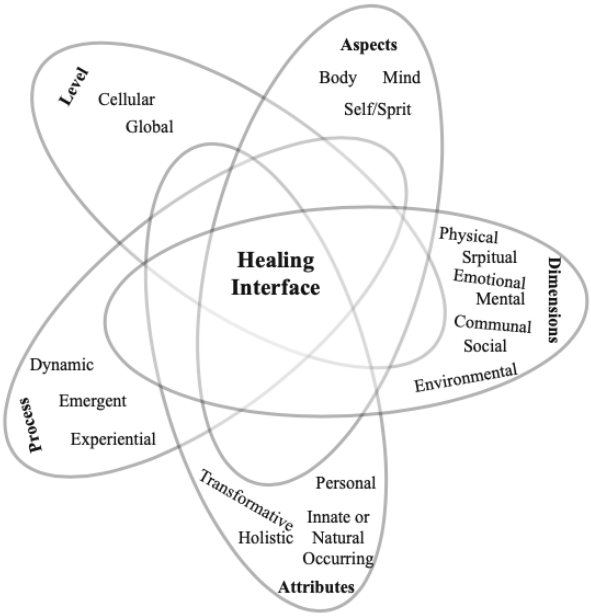

Figure 3 The healing interface. The image describes the complexity of healing.

However, the fundamental question of healing remains unanswered. Is healing an intervention, a process, an outcome, or all three? As discussed above, healing is a complex phenomenon that is often discussed in relation to another complementary term, namely health. Therefore, it becomes crucial to examine the concept of health, its dimensions, and its determinants in order to contextualise the healing debate. Additionally, it is significant to note that the words for health and healing share a

[2] To read more on levels of deviation, kindly refer to reference [16] [17]

common root and are both derivations of the old English word *hǣl*, which means wholeness.

The concept of health is similarly dynamic to that of healing. According to the World Health Organization (WHO), health is "a state of complete physical, mental, and social well-being, rather than merely the absence of disease or infirmity" (World Health Organisation, 2006). Whereas in biomedicine, health is defined as the "absence of disease" (Saad & Prochaska, 2020). The ecological concept of health defines it in terms of adaptation (Mallee, 2017), and for the Psychosocial model - health is both a biological and social phenomenon (Martikainen, Bartley, & Lahelma, 2002). Naturalists, on the other hand, define health in terms of physical, natural, biological, or physiological processes that can be measured and observed using modern technology (Boorse, 1997). For example, Boorse's Biostatistical Theory of Health (BST) states that a "person is healthy if and only if, all-natural organ function normally under statistically normal conditions" (Boorse, 1997). Boorse's definition of normal for a functioning organ is based on 'species design,' in which each organ can be statistically measured separately (Boorse, 1997) (Saad & Prochaska, 2020). However, the problem with this definition is that it evaluates parts rather than the entire body as a unified and connected system. The holistic philosophy, on the other hand, considers health to be a value-laden phenomenon (e.g. vital goals, meaning, and purpose) (Nordenfelt L. , 2007) (Saad & Prochaska, 2020). For instance, the Holistic Theory of Health (HTH) proposes that a person is healthy if and only if (under normal conditions) they are able to achieve their important vital goals (Nordenfelt L. , 2007). According to this definition, health is defined as a positive state of equilibrium (not biological homeostasis) between capabilities and goals (Saad & Prochaska, 2020). Even though HTH does not define health in statistical terms, it also does not define it in a non-biological term.

Numerous hybrid and integrative models have attempted to synthesise the concept of health and develop a health philosophy. The one discussed here was created by Saad and Prochaska (2020). According to their model, ‘health is a state of maintainable-ease of functioning, and a disease is a state of prolonged dysfunction that prevents ease’ (Saad & Prochaska, 2020). In other words, being in a state of dis-ease can be considered unhealthy. This model provides a systemic view of health and attempts to integrate the biological function, behaviour function and social function of an individual or a system.

According to this model, health can be observed at multiple levels, including the cell, the self, and society. As a result, the determinants of health can be anything from the individual's internal and external world, such as food, age, behaviour, culture, and environment.

1.3.3 Review of literature on the concept of indigenous healing and health

Indigenous healing is a diverse holistic health care approach practised by indigenous people all over the world. However, there is little knowledge available to explain the phenomenon of indigenous medicine and indigenous health. There is even less information available about how indigenous healing occurs. However, the use of herbal medicine in indigenous treatments, the importance of culture in shaping indigenous healing culture, the role of psychology and culture in traditional healing, and many other aspects of indigenous healing tradition have all been the subject of extensive and in-depth research by a variety of scholars. The crucial role of culture in shaping indigenous healing techniques and knowledge has also been extensively studied.

The various aspects of indigenous healing, including types of healers, training for healers, and the role of healers in their communities, are also extensively discussed in both the Indian and global contexts (Haque, Chowdhury, Shahjahan , & Harun , 2018) (O'Connor & Hufford, 2001) (Mokgobi , 2014) (Edwards, 2014)**.** Julian A. Robbins (2011) critically studies traditional indigenous approaches to healing and the modern welfare of traditional knowledge and spirituality, whereas Roxanne Struthersa et al. (2004) studied traditional healing, indigenous peoples, traditional healers, health within indigenous culture, traditional healing techniques, utilisation of traditional healing, and comparison of traditional healing principles with mainstream approaches (Robbins & Dewar, 2011) (Struthers, Eschiti, & Patchell , 2004).

In a study titled *"Subaltern Medicine and Social Mobility: The Experience of the Ezhava in Kerala"* published by Burton Cleetus in 2007, the author examined the historical analysis of traditional medicine in India and how it influenced the emergence of personal identity (Cleetus, 2007). This study also raises significant issues regarding who owns the right to cures. Whereas, theoretical study presenting a brief historical overview of traditional healing practices and discussion on their persistence and efficacy in the modern world as well as how they may contribute to the pluralistic model

has been studied by Rodrigo Barros Gewehr and et. al. (2017) in the research paper titled as "*On traditional healing practices: subjectivity and objectivation in contemporary therapeutics"* (Gewehr, Baêta, Gomes, & Tavares, 2017).

However, most of the studies on indigenous healing practices deal with the integration of traditional medicine with western medicine from multiple points of view viz. health policies, psychiatry training and evolution of personal and professional identity, mainstream treatment model, seeking safety and also bridging the gap between indigenous and Western sciences by paving the new way for traditional, complementary, and alternative medicine systems. (Wing 1998) (Amy and Ray 2013) (Bayetti and et.al 2018) (Marsh, Young and et.al 2016) (Gautam and Jain 2010) (Gewehr, Baêta and et.al 2017).

The indigenous concept of health has not been the subject of as much research as healing. The existing literature on indigenous health equates the indigenous concept of health with holistic health, which is defined as "A state of complete physical, mental, environmental and social wellbeing including the absence of determinants of disease in the body or in the close proximity that can cause harm by use or by contact with the body" **(Dharmshaktu, 2018)**. Furthermore, it states that in order to be healthy, the mind, spirit, and emotions must all be in harmony and balance. Any disruption or imbalance among these can be considered an illness. The idea behind this definition of health is the philosophy of wholeness or interrelatedness, i.e., everything having a life is interconnected and affects each other. It is important to mention here that indigenous communities not only follow but customarily live by the philosophy of wholeness or interrelatedness.

However, Suchismita Mishra and et al. (2013) studied the concepts of health and illness among migrant tribal communities in an Eastern Indian city. According to them, the concept of health and illness is dynamic in nature and changes, whereas their native logic, beliefs, perceived causes, recognition and classifications of illness, and subsequent management are static, and tribal people continue to hold these components when a community migrates/changes its living place (Mishra, Kusuma, & Babu, 2013). While Pati (1998) provides an understanding of disease and disease in the context of

colonialism and shows how diseases were attributed to plural factors and therefore treated by a plurality of healing practices (Biswamoy, 1998).

1.3.4 Review of literature on ethnographic studies on Selected Tribal Communities (STCs) of Nilambur valley

The ethnographic study of STCs includes the subsistence practice of the community, their material culture, habitats, food habits, material culture and belief system. The findings of the study have been discussed in detail in section 3.2 of chapter 2, which provides the ethnographic profile of the community.

The ethnographic studies on the Aranadan tribe were presented by VP Sreejisha (Sreejisha V. P., 2014), C. A. Fuckar Ali (Ali, 2009), Seetha Kakkoth (Kakkoth S. , 2001), Viswanathan Nair (Nair V. , 1990) and Luiz (Luiz A. , 1962); on Kattunaickan were presented by VP Sreejisha (Sreejisha V. P., 2014), C. A. Fuckar Ali (Ali, 2009), and Mathur (Mathur P. R., 1977a) (Mathur P. R., Tribal Situation in Kerala, 1977b); on Cholanaickan were presented by VP Sreejisha (Sreejisha V. P., 2014), C. A. Fuckar Ali (Ali, 2009), Bhanu (Bhanu B. A., The Cholanaickan of Kerala, 1989); and on Kattupaniyan were presented by Seetha Kakkoth (Kakkoth S. , 2001), Viswanathan Nair (Nair V. , 1990). Viswanathan Nair (1990) identified the Kattupaniyan as a sub-section of the Paniyan tribe.

Studies on the Aranadan tribes report that they are the least numerous tribes (among of the 35 tribes in Kerala), autochthonous, and primarily endogamous, but have recently begun to embrace exogamous marriage (Kakkoth S. , 2001) (Nair V. , 1990) (Sreejisha V. , 2014) (Luiz A. , 1962). They were formerly hunter-gatherer tribes, according to the study, and speak a mix of Tamil, Malayalam, Kannada, Tulu, and Telugu (Nair V. , 1990) (Sreejisha V. , 2014) (Kakkoth S. , 2001). Their subsistence practices include food gathering, non-wood-forest product (n.w.f.p) collection and sometimes forest labour (Sreejisha V. , 2014).

The Cholanaickan tribes, according to studies referred to above, are also autochthonous, largely endogamous, speak a mix of Malayalam, Tamil, and Kannada and participate in subsistence activities which include food collection and non-wood forest product collection (NWFP.) alike Aranadan (Bhanu B. , 1989) (Ali, , 2009) (Mathur P. , Cholanaickans of Kerala , 1977a) (Mathur P. , Tribal Situation in Kerala, 1977b).

Whereas, the Kattunaickan live in the lower semideciduous valley and practise food gathering using non-wood forest products. (Ali, , 2009) (Sreejisha V. , 2014). They are found in the Wayanad, Malappuram, and Kozhikode districts of Kerala as well as in Andhra Pradesh, Karnataka, and Tamil Nadu. They are mostly endogamous with some exception's relation to Cholanaicken. (Ali, , 2009) (Sreejisha V. , 2014).

However, the Paniyan, according to the studies cited above are the numerically dominant tribe among the 35 Scheduled Tribes of Kerala. Their subsistence strategies include agricultural labour related to paddy cultivation and n.w.f.p collection (Kakkoth S. , 2001) (Nair V. , 2010). Viswanathan Nair (1990) identified the Kattupaniyan as a sub-section of the Paniyan tribe (Kakkoth S. , 2001) (Nair V. , 2010).

1.3.5 Review of literature on health, healing practices and knowledge of ethnomedicine of STCs

There exist few studies that concentrate in-depth on the health and healthcare practices of STCs. Scholars like Viswanathan Nair (2010) and Pius O L (2015) have written about tribal health and the use of medicinal plants used by the tribal communities of Kerala and Malappuram districts (particular) respectively (Nair V. , 2010) (Pius, 2015). According to the studies, STCs developed their own medicinal practices to cope with the disease by utilising locally available medicinal herbs, shrubs, trees, climbers, minerals, and animals. (Nair V. , 2010). The studies also address several forms of ceremonial and religious healing employed by the STCs (details are discussed in chapter 3). The STCs' procedures for disease recognition, aetiology, diagnosis, and methods and modes of therapy for illnesses, injuries, and traumas, however, are rarely covered in these researches. As a result, the primary research gap is the lack of a thorough study and articulation of indigenous healing systems of STCs.

While ethnobotanical studies of ethnomedicinal plants are extensively studied, Chithra M. and Geetha S. studied plant-based treatments for the treatment of rheumatism and another twenty chosen diseases among six tribal communities, namely the Arnadan, Cholanaickan, Kattunaickan, Kuruman, Muthuvan, and Paniya tribes of Malappuram district, Kerala. (M, KM, & SP, 2016). This study documented 73 plant species that were used to treat rheumatism (M & SP, Plant based remedies for the treatment of rheumatism among six tribal communities in Malappuram , 2016). Renjini Haridas et al. (2015) studied 90 potential medicinal plant species used by the Kattunaickan

(Haridas, V, & Thomas, 2015). Das et al. documented the ethnobotanical knowledge of wild edible and medicinal plants among the Muthuvan and Kattunaickan tribes of Palakkayam settlement, Nilambur area of Malappuram district, Kerala (Das, Stalin, Muthumperumal, & Swamy, 2013). Thomas et al. (2012) studied the wild edible plants and their contribution to the dietary balance of the tribe Cholanaickan in the Nilambur forest, Western Ghats of Kerala, India. The study lists 40 edible wild plant species from 25 families and 31 genera that are vital to the Cholanaickan tribe of Kerala's Nilambur Forest in maintaining their nutritional and health care balance (Thomas, Mathews, Rajendran, & Sivalingam, 2012).

However, hardly these studies discuss the STCs' methods of disease recognition, aetiology, and methods and modes of treatment for diseases, injuries and traumas. Although, it provides in-depth of their social-cultural practices and the ethnographic profile of the STCs.

1.4 Background of the study

Scholars from anthropology, historical epidemiology, and archaeology have extensively published and discussed how foragers and hunters were (and still are) vulnerable to various diseases and illnesses as a result of their direct/indirect exposure to or interactions with toxic plants, animals, insects, and parasites. (Dunn F. , 1968) (Orman A. , 1971) (Armelagos & Barnes, The evolution of human disease and the rise of allergy: epidemiological transitions, 1999) (Armelagos, Brown, & Turner, Evolutionary, historical and political economic perspectives on health and disease, 2005) (Black, 1975) (Cockburn, 1971). To cope with diseases or illnesses the hunter-gatherer community also have their own health care system using locally available medicinal herbs, shrubs, trees, climber, minerals, and animals (Groeneveld, 2018) (Ungar & Grine, 2006) (Barnes, Armelagos, & Morreale, 1999) (Fábrega, 1997) (Ackerknecht, 1946) (Nair V. , 2010). The above-mentioned health-care practices are described as indigenous or traditional or folk healing practices (as mentioned in section 3.2 of Chapter 1). Selected Tribal Communities of Nilambur Valley, Kerala (STCs) healing practices are an example of such a healthcare system discussed above. However, their healing practice is one of a kind because STCs use unique socio-cultural practices,

rituals, beliefs, plants, and animals in their healing practices (Kakkoth S. , 2001) (Nair V. , Tribal Health and Medicine in Kerala. DC Books., 2010) (Sreejisha V. , 2014).

The present study is designed in the cross-cultural context of four Selected Tribal Communities of Nilambur Valley, Kerala (STCs) and aims to document their indigenous healing practices. The STCs are namely Cholanaickan (C), Kattunaickan (K) Aranadan (A) and Paniya/Kattupaniya (P). These communities were and are (to a substantial level) family-level foragers and hunters. Their subsistence activity makes them vulnerable to various kinds of diseases and illnesses. To cope with diseases and illnesses, STCs have their own tradition of healing, which is non-codified and practised orally. It is important to note that STC's healing practices are associated with their subsistence practice and their knowledge of plants and animals is mostly stored as collective knowledge in the ecological context, in the absence of a script for documentation. The absence of proper documentation of the knowledge system makes it extremely vulnerable to change or transition. This research aims to document STCs' health, discuss their ethno-philosophy of health and healing, and analyse how the transition in lifestyle impacts their health. This study is important for the conservation and preservation of the indigenous knowledge system and will also provide a definite dataset to the researcher who is interested in conducting scientific studies on ethnomedicine. The goal of the study will be guided by the following questions to facilitate responses to specific information

1.5 Aims and Objectives

The present study aims to document the indigenous healing traditions of Selected Tribal Communities of Nilambur valley, Kerala (STCs). The STCs are namely Cholanaickan (C), Kattunaickan (K) Aranadan (A) and Paniyan/Kattupaniyan (P). The objectives of the present study are:

I. To document and analyse the various traditional healing practices, beliefs, and knowledge systems of selected tribal communities, and to understand their cultural, social, and ecological significance.
II. To understand the role of knowledge management in preserving and promoting the use of indigenous healing practices, and to identify culturally sensitive and sustainable strategies for supporting the management and dissemination of this knowledge within selected tribal communities.

III. To understand transitions in lifestyle and their impact on the indigenous healing practices of the STCs.

1.6 Research Questions

I. What are the healing techniques and methods used by the selected tribal communities of the Nilambur valley, Kerala (STCs)?
    a. what are the methods of disease recognition for common and uncommon diseases?
    b. how do STCs identify the nature and cause of diseases/illnesses?
    c. what are the methods of treatment for diseases, injuries and traumas?
    d. what are the modes of treatment?

II. What forms of therapeutic remedies are used by the STCs?

III. What are the methods of learning, storing and intergenerational transfer of health and healing knowledge of STCs?

IV. How does the transition in the lifestyle, subsistence and settlement pattern affect the healing practices of STCs?

1.7 Advantages and Disadvantages of being an outsider

Exploring indigenous healing practices and conducting research on them from an "outside-in" perspective can present both opportunities and challenges. There are several disadvantages that one may encounter, including:

1.7.1 Advantages

Broader Understanding: By incorporating outside knowledge and expertise, an outside-in perspective can provide a broader understanding of indigenous healing practices. This can help to contextualise the practices within a larger body of knowledge and provide insight into how they compare to other forms of healing.

Objectivity: An outsider's perspective on indigenous healing practices can provide a more objective view. Researchers may be less emotionally invested in the practices than insiders, allowing them to approach the research with greater objectivity.

Access to New Perspectives: Outsiders may bring new perspectives and ideas to the study of indigenous healing practices. It may be possible to gain new insights and ideas about these practices by engaging with scholars and researchers from various backgrounds and cultures.

1.7.2 Disadvantages

Lack of Cultural Competence: Researching indigenous healing practices from the outside can be difficult if the researchers lack cultural competence. This can lead to misinterpretations or misunderstandings of the practises, resulting in inaccurate or incomplete findings.

Lack of cultural understanding: Outsiders may be unfamiliar with the tribal communities they are researching's cultural and traditional practices. During the research process, a lack of cultural understanding can lead to misunderstandings, misinterpretations, and miscommunications.

Lack of trust: Due to historical experiences of exploitation, marginalisation, and cultural appropriation, tribal communities may be hesitant to share their knowledge and practices with outsiders.

1.8 Significance of the Study

This study is important for the preservation and revitalisation of the indigenous health-related knowledge system and will also provide a definite dataset to a future researcher who is interested in conducting further research on the health and healing system of STCs. This research documents the healing practices of STCs and discusses their ethno-philosophy of health and healing. The study reviews the policies that are implemented (in India and particularly in the selected study area) for the revitalisation of the knowledge system and suggest a new policy recommendation for the better utilisation of the knowledge system. Apart from the above-listed contributions and outcomes, the study also benefits the community in the following ways:

a. The knowledge of the communities is being lost as it is passed down verbally from one generation to the next, with no script to document it. The

documentation of their knowledge will help in the preservation of their knowledge.

b. The research's findings will be translated into the local or Malayalam language and submitted to the community's leader and the Gram Panchayat office so that future generations can always refer back to the knowledge that has been documented.
c. The research findings will also help healthcare professionals and policymakers in developing a relevant and community-specific healthcare programme, which will benefit the community by providing improved health and healthcare facilities.

1.9 Limitations of the Study

I. This study is limited to the healing practices of STCs in Nilambur Valley, Kerala. Additionally, it is restricted to STCs who have settled in the forest as well as its periphery. The research is primarily focused on medical systems, with special emphasis on the STCs' healing methods and modes. Comparative analysis of STCs healing practices with other medical systems like AYUSH and allopathy is outside the purview of this study.

II. This study will only use ethnographic data; no medical examinations, biological sample collection, or medical testing on STCs will be used; as a result, no specific health conditions of a community member will be recorded.

III. The study focuses on STCs' healing practices rather than medicinal plants and their efficacy as used in STC healing practices. As a result, while medicinal plants are discussed, the goal of this study is not to determine whether they are useful in treating specific illnesses.

IV. The selected colonies of the population sample are placed deep inside the forest, which is a Naxalite-prone area, therefore, no one is permitted to stay after 5 pm (as per government regulation). This has restricted the scope of research in the following ways:

    a. Limited movement with the community for area survey

b. Observation is only possible for day activity
c. Guided tours were limited, therefor, not visit all the traditional *alais* of the STCs

V. Since the selected area are classified as Naxalite prone zone, therefore, the field visit was accompanied by the police and forest department officials, which sometimes creates an obstacle in the free flow of information.

VI. Language barrier: This operates at two levels for the researcher. Since the researcher was not a native speaker of, the selected community's language nor common communication language i.e., Malayalam, therefore, the full data were collected with the help of imperators and translators, who was also not a native speaker of the selected community. The process has a limitation of word translation problems, human error, difficulties in deducting the emotional response etc. The second level of difficulty posed in the literature review. The limited Malayalam literature was referred to because of the language limitation. This is also important to clarify that the Malayalam literature has been referred to by using google translation which has its limitation.

VII. Covid-19: The two years of lockdown have limited the fieldwork for a short period. Due to that, the third phase of data collection was possible.

VIII. Secrecy: Members of the community maintain complete secrecy in information sharing, which has limited the data collection among the willing participants.

1.10 Structure of the thesis

This study is divided into six chapters. Chapter 1 serves as the introduction to the entire thesis. Chapter 2 presents a brief description of the research methods and methodologies chosen for the study of indigenous knowledge of healing among the selected tribal communities of Nilambur valley, Kerala (STCs), Chapters 3, 4 and 5 address the research questions, present an analysis of collected data and discusses the findings of the research. The final chapter, Chapter 6, then provides a summary of the findings and conclusions made in response to the study questions posed in Chapter 1 and also provides recommendations for further research and policymaking. In addition

to these main chapter divisions, there are appendixes that contain the list of medicinal plants, sample interview guides and questionnaires, and other supplementary data.

Chapter 1: Introduction

It discusses the Epistemology of Indigenous Knowledge of Healing, key terms used in the research, literature review including the literature search strategy, background of the research, aims and objectives, research questions, the significance of the study, limitations of the study, structure of the thesis and scope for the future research.

Chapter 2: Research Methodology

The chapter is divided into three parts. Part I includes a brief background of the researcher and his position to reveal any potential biases in the research; part II consists of the study area, study population and ethnographic profile that includes a brief description of STCs' name and origin, habitats and subsistence practices, material culture and technology, and social and religious organization; and part III elaborately discusses the process of data collection and data analysis methods and methodology chosen for this research.

Chapter 3: Health and Healing Practices

This chapter examines different aspects of STCs' health perceptions, healing practices, and how the underlying systemic structure of healing practices functions and effectively delivers healthcare to its members. It essentially answers the first and second research questions.

I. What are the healing techniques and methods used by STCs?
II. What forms of medicine or therapeutic remedies are used for the healing practices by the STCs?

This chapter begins by briefly discussing the potential settings that make STCs prone to various diseases or illnesses, the STCs' idea of health and healing, the aetiology or disease causation theory, the diagnosis system, and the technique of appropriate

therapy. Following an examination of STCs' healing processes, the chapter finishes by categorising STCs' healing practices into two conceptual categories: recursive and idiosyncratic (as data presented). It also discusses the ethical consideration of this research.

Chapter 4: Healing Knowledge Management

This chapter discusses the characteristics of STCs healing knowledge, the process of knowledge management, which includes the process of knowledge acquisition, knowledge development and storage system and knowledge transmission and distribution system, and the challenge in healing knowledge management. It also discusses the and role of gender in healing knowledge management.

Chapter 5: Lifestyle Transition and its implication on the health and healing practices

This chapter investigates the factors that lead to a change in lifestyle among STCs, such as the forced implementation of intensive development programmes and policies, and discusses how unplanned intensive development can have a negative impact on STC health outcomes.

Chapter 6: Summary, Conclusion and Recommendations

This chapter provides a summary of research findings, and challenges in the STCs healing tradition and provides a policy suggestion.

1.11 Scope for Future Research

This study offers insight into STCs' healing practices and advances a theoretical framework for how policymaking and STCs' health are related. However, more empirical data is required to statistically test the theory. There is additional potential for statistical and other types of analysis of ethnomedical plant data.

CHAPTER 2: RESEARCH METHODOLOGY

2.1 Introduction

This chapter presents a brief description of the research methods and methodologies chosen for the study of indigenous knowledge of healing among the selected tribal communities of Nilambur valley, Kerala (STCs). It is important to highlight that the study has used an ethnographic approach and case study method to understand socio-cultural contexts, processes, and the meaning of healing within STCs' cultural systems. The reason for the selection of the above-mentioned approaches and methods is addressed in detail in the following sections. In addition, the chapter also describes the scope and limitations of the research design and situates the research within the present research tradition.

The chapter is divided into three parts. Part I includes a brief background of the researcher and his position to reveal any potential biases in the research; part II consists of the study area, study population and ethnographic profile that includes a brief description of STCs' name and origin, habitats and subsistence practices, material culture and technology, and social and religious organization; and part III elaborately discusses the process of data collection and data analysis methods and methodology chosen for this research.

Part- I

2.2 The need for researchers' brief background and position

Before delving deep into the details of the opted methods and methodology, it is extremely important to discuss the intricate relationship between the researched and the researcher in the context of Indigenous Knowledge (IK). It is because the researcher in the field carries their cultural biases, knowledge position and inherent vulnerability in the co-production of research. The non-disclosure of the researcher's position and the relationship between the researched and the researcher may confuse the reader and the research can be misread as agenda-based research.

Therefore, in the context of Indigenous Knowledge (IK), the disclosure of the research's position and background becomes exceptionally critical because, according to Keane & et al. (2016), 'IK research has not gone far enough in crossing the barriers between *self* and *others*[3]*'* (Keane, Khupe, & Muza, 2016). To put it another way, IK research is still centred on the emic and etic perspectives in which researchers only explore their own fluctuation of experience in terms of *superior* and *inferior* knowledge positions[4]. For example, the most researched IK themes are motivated by the concept of IK as heritage knowledge, searching for its recognition, defending its rights, protecting its threatened status, arguing for its validity against western frameworks or vice versa, and probing for how to use its sustainable method (in most cases) outside its local context.

Additionally, with the help of a literature review, and also learning from previous work, it is well understood that in any social science research, though research is central to the process but the role of the researcher is extremely important in the process because s(he) designs the research, collects data, and gives meaning to the data after analysis. Thus, the researchers' cultural biases, interests, and power relationships are integral to the research and mutual influence (between the researched and the researcher) is inevitable (Keane, Khupe, & Muza, 2016). Keane et al. (2016) and Lumsden (2012) have also argued that 'research is not a neutral knowledge creation' and 'the researcher consciously or unconsciously takes a position' (Keane, Khupe, & Muza, 2016) (Lumsden, 2012). On the other hand, Mutua and Swadener (2004) have contended for the acknowledgement of researchers' non-neutral position by stating the reason that the research involves the knowledge re-discovery process which is influenced by sociocultural experiences and shapes future thinking (Mutua & Swadener, 2004). Scholar like S Gregory (2007) has also noted that multiple dimensions of a researcher's identity are extremely critical in the anthropological study of society because his/her degree of affliction makes him/her an insider or outsider in the research process. (Gregory & Gregory, 2007)

[3]Wyn-Davis, M. (2014) in his book *Introducing Anthropology: A Graphic Guide* has defined anthropology as the systematic study of *others*[3] (as anyone who perceived as different and used to inter-define one's own identity).

[4]Raheen, et al. (2016) establish an anti-authoritarian relationship between researcher and researched and map shift in researchers position and vulnerability.

Drouin-Gagne (2014) has argued that in IK research, the researcher's position is usually absent, however on the other hand researchers write about the inclusion of the participant's voice in the research (Drouin-Gagne, 2014). To bridge the above-mentioned gap, the researcher has opted to disclose his research position and background, as well as other details such as methods, methodology, study area, the ethnographic profile of the selected study population, etc. This approach will assist readers in comprehending and contextualising the researcher's choice of methods, methodology, data analysis, and meaning-making processes.

2.3 Researcher's brief background and research position

I am Rakesh Kumar. I was born and brought up in the small town of Begusarai (one of the districts of the state of Bihar, India). I belong to *Bhumihar-Brahmin* (a non-tribal) community. Before going into my details, let me concisely introduce my community first. The *Bhumihar-Brahmin* community belongs to the Hindu upper caste in the social hierarchy of Bihar (Das A. , 1982). Various myths and legends are associated with the history and origin of the community. It has also a long history of the class-caste struggle. The community got the status of *Bhumihar-Brahmin* in the 19th century (Kumar, 2008). The history and myths are not important for the current purpose; therefore, I choose not to mention them here. The *Bhumihar-Brahmins* are mainly found in Bihar (Mithila region), Uttar Pradesh (Purvanchal region), Jharkhand, Madhya Pradesh (Bundelkhand), and Nepal (Jha, 1997). Etymologically *Bhumihar* (*Bhoomi*-land) means the class of 'landowner'. Now, let me clarify my position here. Though I was born into an upper-class group (in terms of social hierarchy), this does not imply that I believe, share, or participate in the rules and regulations of caste, class or other related beliefs such as untouchability, social hierarchy, etc. . However, I do adhere to certain cultural, religious, moral beliefs, and *samskaras* of the community.

I have grown up in a popularly followed culture of my home town. It was an amalgamation of traditional values and western culture. Since this research is related to healing tradition, I choose the example of healing tradition to set out a snapshot of our culture. We mostly take consultation of allopathic medicine (also known as western medicine) but based on circumstances we also resort to homoeopathic and Ayurvedic medicine. For example, at the primary stage of sickness, or in the case of seasonal

diseases, we usually prefer ayurvedic, home remedies, or homoeopathic medicine. However, in case of critical conditions, we choose to go for allopathic consultation. We also believe in faith-healing and magico-medicinal practices but these are limited to some very special cases, for example, when illness persists for long, we consult faith healers in addition to allopathic or ayurvedic medication.

I completed both my Senior Secondary Certificate (SSC) and Higher Secondary Certificate (HSC) from Begusarai in Hindi and English medium respectively. For my HSC, I studied physics, chemistry, mathematics, and literature. After completing my HSC, I moved to Banaras Hindu University (Varanasi, UP) for my Bachelor's degree. There I studied Ancient Indian History, Culture and Archaeology (AIHC & Arch.), English literature, and Office Management as three major subjects; and finally received my honour's degree in AIHC & Arch. For my further studies, I enrolled in Deccan College Post-graduate and Research Institute (Pune, Maharashtra). There I continued my interest in AIHC & Arch and received my Master's degree in the same with a specialization in Indology (which consists of ancient Indian architecture, epigraphy, and numismatics). But the five-year journey in archaeology made me develop a subsidiary interest in prehistory, hunter-gatherer communities of past and present, ethnography, and ethnoarchaeology. This was one of the prime motivations to choose my master's dissertation topic on black magic/magico-medicinal practices of Mayong, Assam. Immediately after completing my master's degree, I joined the Consciousness Studies Programme of the National Institute of Advanced Studies as a Research Associate for the project titled "Kerala Indigenous Healing Tradition". After working for a few months, I decided to join as a PhD and expanded the project objectives into a PhD thesis. As mentioned in the chapter, my study focuses on the indigenous healing traditions of four tribal communities of Nilambur valley, Kerala.

Some of the important questions that cropped up in my mind included (a) what is the purpose of the study? (b) Why do I choose this particular topic, area, and community? (c) How do I select the study area and study population? and how do I carry out my research? Answers for 'what' and 'why' questions are discussed separately in chapter one (i.e. Introduction Chapter). However, answers to the 'how' question are derived and discussed (in detail) in subsequent parts and sub-sections of this chapter.

Part-II

2.4 The Study Area

Out of 550 tribal communities of India, Kerala is the home of 37 tribal communities and eight out of these are residing in the Nilambur Forest Division. The study area and study population were selected after a systematic literature review and pilot survey. Fig.4 contains the details of the pilot study.

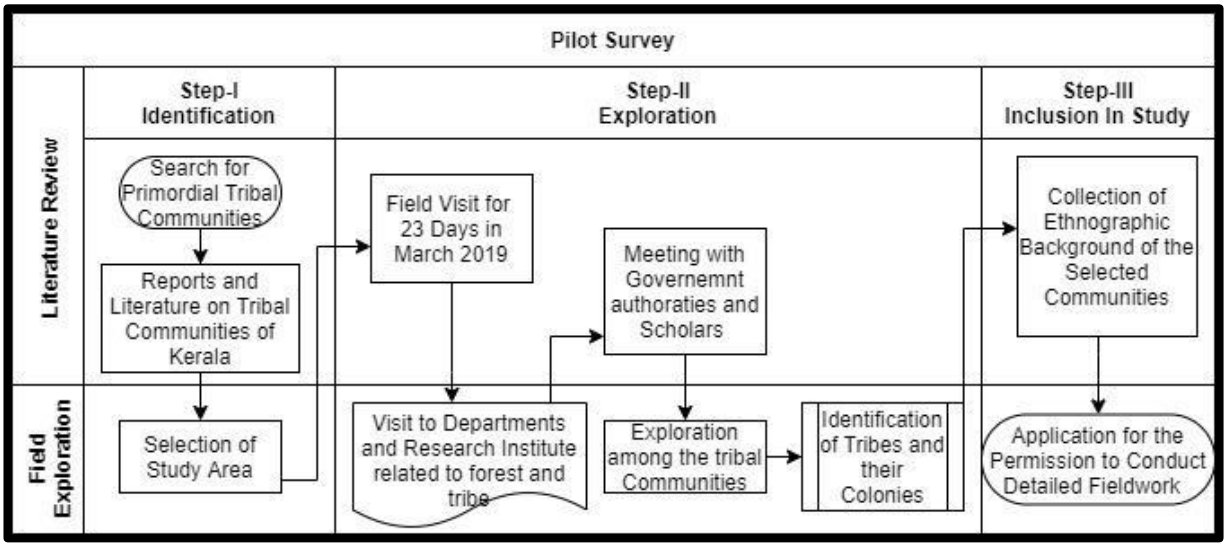

Figure 4 Flowchart of Pilot Survey

The study was carried out in the Nilambur valley of Malappuram district of Kerala (Fig 5 & 6). In the British record and *1951 Census Handbook of Malabar District*, the present Nilambur taluk and its surroundings were collectively referred to as Nilambur Valley (Government of Madras, 1951). Its political boundary is coterminous with Nilambur taluk which was formed in 1966 (Kakkoth S. , 2001). The Nilambur taluk is also known as Eastern Eranad Taluk (Government of Kerala, 2019). The valley is located between 11° 26′ - 11° 9′ N latitude and 75° 48′- 76° 33′ longitude with an altitude range of 50-2500m AMSL. It is important to mention here; the area and settlements that I have covered during my fieldwork are having a mean elevation of 264 ± 20m AMSL.

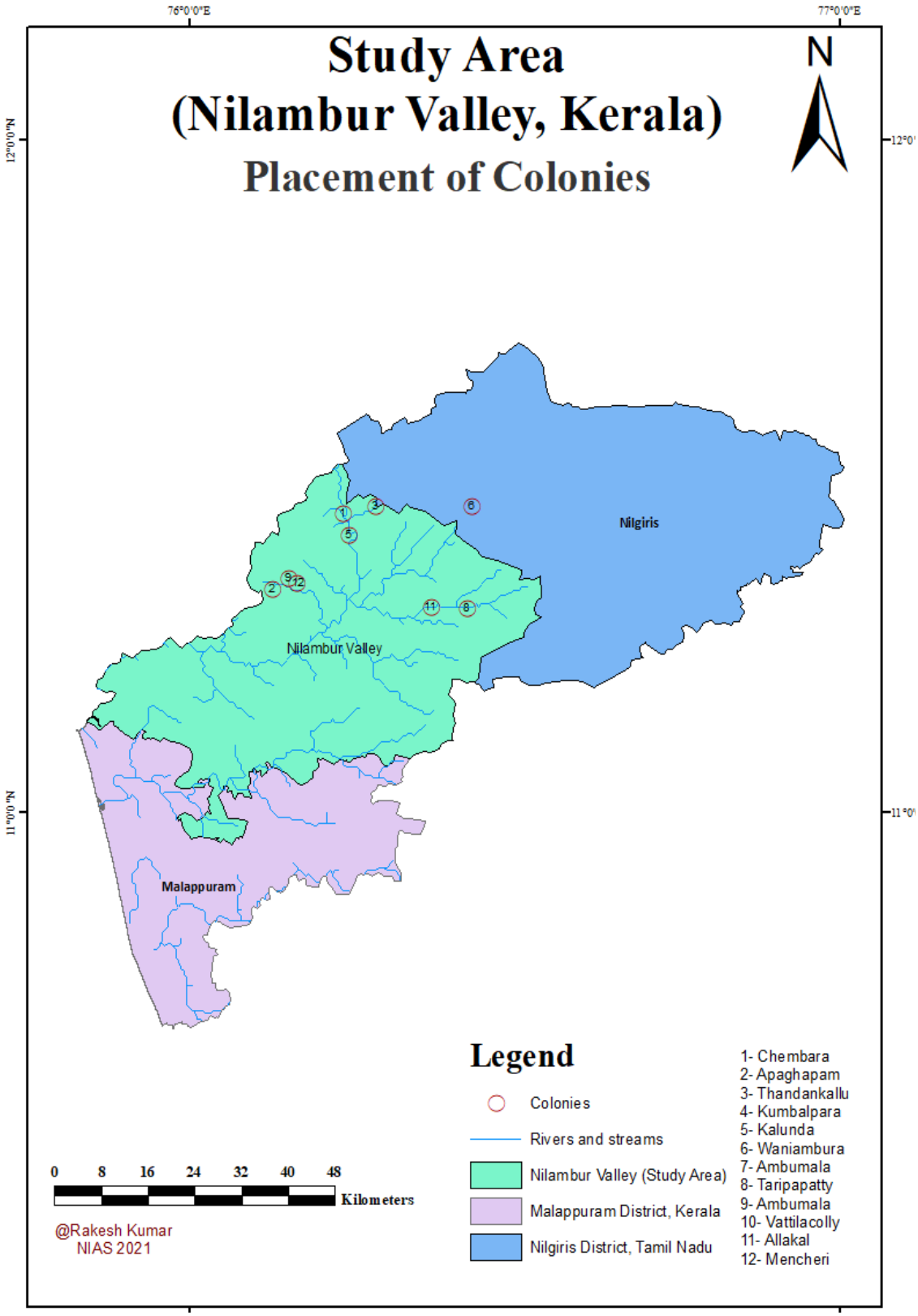

Figure 5 The Map of Study Area and Placement visited colonies

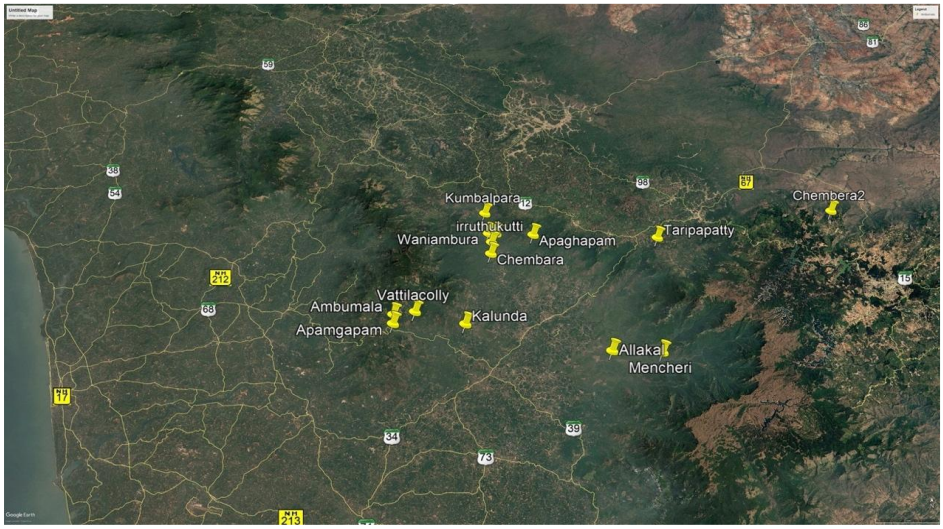

Figure 6 Placement of Visited Colonies with Names (Created by using Google Earth Pro and GPS Garmin 010-01199-10 (R) 64s)

2.4.1 Physical Geography and Geometrics of Nilambur valley

Nilambur valley is connected with networks of rivers and rivulets. One of the important networks is of river Chaliyar and its tributaries viz. Karimpuzha, Chalipuzha, Cherupuzha, Thalipuzha, Korapuzha, etc. (Fig. 5). Almost all the settlements of the selected communities are placed on the bank of the Chaliyar river network. The Chaliyar is a perennial river that originates from the Illambaleri hills of the western ghats in the Nilgiris District of Tamil Nadu and falls into the Arabian Sea. The region of the Chaliyar river is known for its natural goldfield (Government of Kerala, 2021).

The valley has more or less identical climate conditions to the mainland i.e. dry winter (Dec-Feb), hot summer (March-May), and five months of the rainy season (June-Sep: SW monsoon and Oct-Nov: NE monsoon). The large area of Nilambur valley is covered with forests, which are largely semi-deciduous and wet evergreen in nature. The Nilambur forest is administratively divided into Nilambur North Forest Division (NNFD) and Nilambur South Forest Division (NSFD). The valley is rich in flora and fauna of tropical nature. It includes high trees of commercial value like teak, mahogany, rosewood, and bamboo to spices, plants, and creepers of medicinal value. But in the last 20-30 years, the forest has experienced a hefty conversion in forest plants from naturally grown forests to teak and rubber plantation. Biogeographers perceive this transformation as a threat to ecological equilibrium (Sundararaju, 2018). Like the

change in the forest plants, the area has also witnessed a shift in land cover and land use (discussed in detail in chapter-5).

2.4.2 The human geography of Nilambur valley

Nilambur is an abode for multi-ethnic and multi-religious communities. Its population consists of both tribal and non-tribal inhabitants. The non-tribal population consists of Muslim, Hindu, and Christian residents respectively based on their population density. The Mappila Muslims of Nilambur are considered as one of the earliest Muslim settlers of India (with the advent of Arabs from the period of the prophet of Muhammad) (Kakkoth S. , 2001). The Hindu population consists of Nair, Thiyaa, Kammala, Kollan, etc. The Christian communities are comparatively new to the land. According to Kakkoth (2001) the majority of the Christians including the Syrian and Latin Catholics, Marthomites, and the Jacobites, are migrants to the Karulai, Vattapadam, Akampadam, areas of Nilambur.

Along with the flora and fauna, the forest is also the abode of wild animals like elephants, bears, wild boars, bison, deer, panther/leopard, monkeys (bonnet macaque & Nilgiris langur), reptiles like snakes and birds (Nair N. , 2008). Though these animals and reptiles are a threat to the indigenous communities residing inside the forest area, they form an integral part of their life and are supportive of their subsistence (food habit) and medicinal practices. The use of animals and their by-products in medicinal practices and food habits are discussed in chapter 3 of the dissertation.

Similar to the non-tribal communities, Nilambur valley is a dwelling place for several tribal communities namely Aranadan, Cholanaickan, Pathmaicken, Kattunaickan, Kattupaniyan/Paniyan, Kuruman, Allar and Malamuthan/Muthuvan (Kerala, 2011) (Kakkoth S. , Three Tribes of Nilambur Valley: A Studt in interrelationship between habitat, economy, society and culture, 2001) (Fuckar Ali, 2009). Aranadan is the least populated ($\leq$ 1.1% of the tribal population) while Paniyan ($\geq$ 59.4% of the tribal population) is the most populated community of Nilambur valley (Fuckar Ali, 2009) (Government of Kerala, Malappuram District Website, 2019).

2.5 The Study Population

A total of four tribal communities of Nilambur valley namely Cholanaickan (C), Kattunaickan(K), Kattupaniyan/Paniyan(P), and Aranadan (A) are carefully chosen for research. These communities were and are (to a substantial level) foraging communities. The subsistence strategy of the Cholanaickan and Kattunaickan includes hunting, food gathering, and fishing, whereas the Kattupaniyan and Aranadan obtain their food with microlevel foraging. It is important to note that the group of Paniyans, who live in the forest of Nilambur call themselves Kattupaniyan (Kakkoth S. , 2001). People of these selected communities are also involved in the non-wood forest product (NWFP) collection, forest wage labour, and medicinal plant collection (details are in the ethnographic profile).

The study population was chosen based on the following criteria:

a. **Involved in healing practice but traditionally do not have professional healers per se**: It represents a model of society that functioned before the development of medicine as an institution and helps to comprehend the diachronic perspective on healing systems in a cross-cultural context.

b. **Oral tradition**: Unlike codified medical tradition, these communities do not have a textual or another medium to document their health and healing knowledge system. It is practiced locally by a certain number of people in a particular landscape. The only method to preserve knowledge is the intergenerational transfer of knowledge. Since their knowledge is acutely embedded in their cultural practice, subsistence model, and lifestyle in general and stored in an environmental context[5], therefore, it becomes vulnerable and documentation of their healing knowledge is very crucial because of three reasons:
    i. Changes in their subsistence and settlement method, landscape, climate, and human-environment-interaction led to knowledge disappearance
    ii. Human error in the intergenerational transfer of knowledge

[5]Environmental storage of Indigenous Knowledge systems is discussed spritely in chapter-3 and chapter-4.

iii. Limited memory. It is easy to forget learned knowledge that is not revised or used for a long time.

c. **Transitions**: These communities are traditionally foragers and actively involved in hunting-gathering, fishing, and collection of medicinal plants. But currently, they are undergoing an inevitable cosmic transition in their subsistence and settlement practices, on which their whole health and healing models are based (details of their transition and effect on health and healing practices are discussed in chapter-4). Therefore, the selected communities have potential data to address the challenge to come about with a developmental model which can have maximum sustainability and utmost space for traditional practices like indigenous healing.

d. **Settlement pattern and place**: Once the community was decided, preference was given to people who are nomadic or settled inside the forest as well as in the fringe area.

The selected communities are distributed in both the NNFD and NSFD areas of the valley. These communities are not fully isolated but rather have incessant interactions with the adjacent non-tribal population of the region. The reason for interactions and the nature of interactions are explored in the consecutive chapters. However, questions like 'how have researcher chosen these communities, are delineated in Part-III of this chapter. But before that, the ethnographic profile of the selected communities is presented to set forth and contextualize my research problems and research findings.

2.6 Ethnographic Profile of the Selected Community

2.6.1 Aranadan

The Aranadan[6] is the smallest tribal community of Nilambur valley. They are listed as a Scheduled Tribe in census data and their dialect is a mixture of Malayalam, Tamil, and Kannada. The age and sex distribution of their demographic data (census 2011) are

[6]Aranadan is singular and Aranadans or Aranadar is plural (Source: Informant from the community during In-depth interviews).

displayed in Fig. 7. The details of their settlements/colonies are shown in Table-I of this chapter, while their demographic data is included in Table-I of Appendix-I.

2.6.1.1 Name and Origin

There are two well-known views in the context of Aranadan nomenclature. First, the name comes from '*Ernadan'* (an aborigine of Ernad taluk) (Thurston, 1909) (Luiz A. , 1962) (Iyer, 1968) (Fuchs, 1973) (Viswanathan , 1990) (Sreejisha V. , 2014). Second, the name probably comes from their living practices in the past, where they used to spend half of the year in the forest and the other half outside the forest (in Malayalam they say *ara-nadu*&*ara-kadu*). In Malayalam '*ara*' means 'half', '*nadu*' means 'country' and '*kadu*' means 'forest'.

The anthropometric studies conducted among Aranadan by scholars like Thruston (1909) and Luiz (1962) have documented their physical features. According to their studies, Aranadans have short stature (height ranges from 156.6 cm -150.6 cm with an average of 154.6 cm), skin complexion varies from pale to dark brown with minimal facial hairs, prominent eyebrows, and platyrrhine nose (Thurston, 1909) (Luiz A. , 1962). Based on studies of physical features and other associated elements, scholars like Thruston (1909) and Luiz (1962) have called Arnadan the primitive tribe.

Tracing the history of any foraging community with having a nomadic past, is exceptionally complex and demands an entirely separate study. Therefore, the researcher chooses to go with the earlier studies (conducted in that direction).

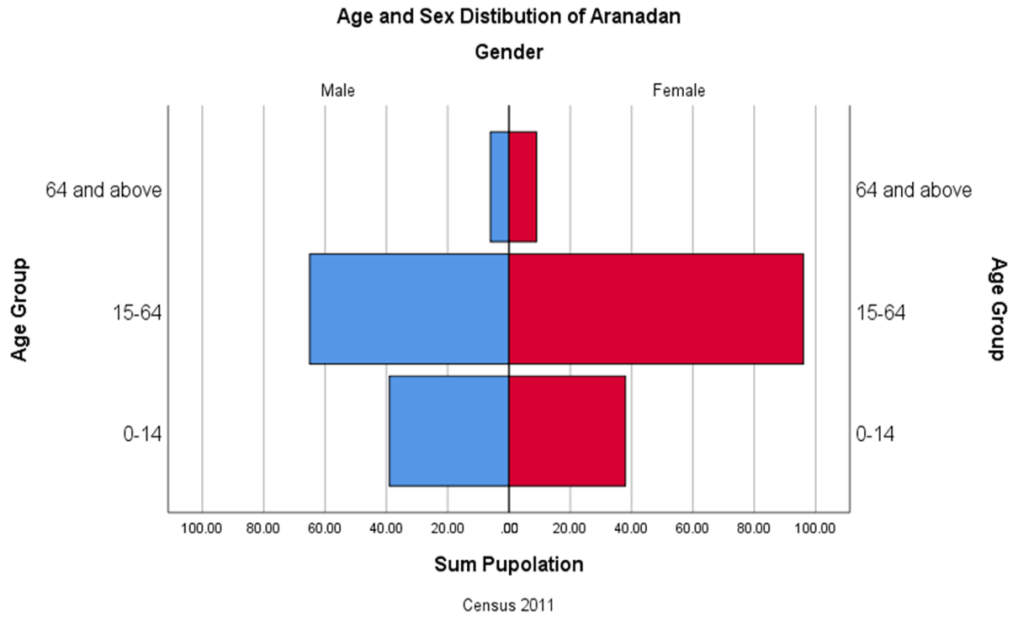

Figure 7 Demographic Data of Aranadan Community (Created by using IBM SPSS v26)

There are several views regarding the place of origin of Aranadan. One of the hypotheses is based on the linguistic-anthropological study and the presence of Aranadan in other adjacent states (Tamil Nadu[7]). One group of scholars believe that the community belongs to the Dravidian family, who probably came to Kerala centuries ago (Parthasarathy , 1998) (Luiz A. , 1962). However, Thruston (1909) describes Aranadans as "a small tribe found exclusively in Malabar". Whereas, Fuckar Ali (2009) has presented an alternate view. He believes that Aranadan-*padam* (the field of Aranadan, *Padam* means field) of Edakkara Panchayat of Nilambur, where a few Aranadan families still live, maybe the corrupted form of Aranadakulam, and could be the original habitat of Aranadan.

2.6.1.2 Habitats and Subsistence Practices

Currently, Aranadans are residing in the *pakka* houses of the colonies provided by the government and their subsistence practices include food gathering, collection of

[7]1991 Census data and writings of K.S. Singh (1996) reports the presence of Aranadan in the state of Tamil Nadu **Invalid source specified.Invalid source specified.**.

medicinal plants, NWFP collection, forest and wage labour, and fishing. But this was not always the case. The government has set up the colonies for the community in and around the 1970s and 1980s and assigned land collectively for houses and agriculture (Kakkoth S. , Three Tribes of Nilambur Valley: A Studt in interrelationship between habitat, economy, society and culture, 2001). Traditionally Aranadans were living at temporary shelters (called *pira*) and natural rock shelters. The *piras* were made of bamboo and leaves with no sidewalls, and no compartmentalization and the full family shares the same space. Often people also share the same *pira* with their pet animals like dogs. Their traditional subsistence strategy includes hunting also along with a few current practices like food gathering, fishing, and NWFP collection. The NWFP includes honey, medicinal plants, and other plants and animals' secondary compounds. Selling of medicinal plants and NWFP among the non-tribal was one of the mediums for them to contact non-tribal people. Once the colony came into existence people started to and fro movement between the colony and forest during peak seasons of NWFP collection. This to and fro movement had occasionally caused tension between Aranadans and neighbouring non-tribal populations over colony land encroachment, which mostly happens in the absence of Aranadans in the colony during peak seasons (Kakkoth S. , 2001). In any case, because multi-ethnic colony inter-community interactions and exchange of ideas, culture, traditions, and beliefs became very prominent. Their food habit includes leaves [e.g. Churuli(Fig.10)], tubers[e.g. kavala(Fig.8), venni (Fig.9)], roots, fruits, messrooms, fishes[8], snakes[9], crabs[10], tortoise[11] and foods provided by the government's schemes like the Public Distributions Systems (PDSs), which is mostly rice.

[8]Aranadan catches varieties of fishes from rivulets and streams. Mostly children are involved in fishing. The list is included in Appendix-I. The list was prepared by adapting the previous studies and data collected during my field work.

[9]Aranadan catches snakes (Python and water snakes) for commercial, medical and eating purposes. They eat the flesh part, sell the skins and fats to market and use their fat as redenies for leprosy and ankle cracks.

[10] The community people catch crabs (*nadu*) from paddy fields, river bed, rivulets etc. and name them based on their finding places (Kakkoth S. , Three Tribes of Nilambur Valley: A Studt in interrelationship between habitat, economy, society and culture, 2001) .

[11]Kakkoth (2001) has reported four varieties of tortoise consumed by Arnadans.

Figure 8 Kavala

Figure 9 Venni

Figure 10 Churuli

2.6.1.3 Material Culture and Technology

Aranadan comes from a hunting-gathering background and to an extent, they still follow similar subsistence practices (except hunting, which they have partially stopped due to various forest regulations and restrictions). But with the change in their settlement pattern (nomadic to semi-nomadic and now permanent settlement), subsistence strategy, interactions with non-tribal communities living outside the forest environment, and outreach of new technology to the colonies have put forward a plethora of dilemmatic choices in front of Aranadans for material culture. On the one hand, they possess traditional utensils and tools like earthen pots, bamboo pieces (*kutti*) and gunny bags (for storage), and iron tools - knife, cherukodali, kottu, and chorakathi (used during food collection, hunting, NWFP collection, and other works). Earlier studies have reported the practice of various traditional tools and techniques like the use of bow and arrow for hunting monkeys and other animals (Fuchs, 1973). Whereas, on the other

hand, they also use modern utensils, gas stoves (occasionally), plastic chairs, solar led lights, electric fans, radios, phones, etc. It is crucial to note, however, that all of the items listed above may or may not be used by one household. Their material culture presents a clear picture of their affinity towards modem tools and technology.

Figure 11 *Aranadan House and Women Kootupara Colony*

As far as their dresses and ornaments are concerned, the older generation people wear their traditional dress i.e. man wears *mundu* and shirt and women wears *mundu* and blouse (Fig.11 and 12). Whereas the younger generation of women wears nightgown, *mundu*, *saree*, and blouses (on special occasions). However, young males mostly prefer to wear *mundu* and shirts but occasionally they also wear pants. Aranadans hardly wear any jewellery or ornaments but again the younger generation of females wears the mala and bead chain (Fig. 11).

Figure 12 Aranardan boys shoring collected NWFP

2.6.1.4 Social and Religious Organization

The primary unit of Aranadans social organization is the family, which is headed by the elder male of the family i.e. from father to eldered son. Aranadans females also enjoy the equal status and opportunity to participate in rituals, social, religious, and religious activity but when it comes to the political head of the *chenmam* (ancestral land), it is always enjoyed by the eldest male of the community called as *Oorumooppan* or *Chaemmakkaran* (the owner of the ancestral land). However, scholars like S. Kakkoth (2001) called Aranadans society acephalous and Fuckar Ali (2009) negate the presence of the mooppan post. Ali differentiates *Chaemmakkaran* from *mooppan.* While in my field among Aranadan, the researcher came across contrasting evidence i.e. the people of the community have frequently used the term '*Oorumooppan*' in both the religious and socio-political context. But at the same time, the descriptions for the *Oorumooppan* or *Chaemmakkaran* successors selection (i.e. based on age not on the descent pattern) are quite similar. This is also important to note that *Oorumooppan* or *Chaemmakkaran* has no control over social law and order. Aranadan witnesses' violence induced by excessive alcoholism, sexual rivalry, inter-ethnic clash, etc. Sometimes intra-community rivalry leads to social fission.

Marriage practices among Aranadans were endogamous in which cross-cousin and parallel cousin marriage were permitted (Kakkoth S. , 2004). The Aranadan population was low and endogamous practice has caused genetic stagnation that has caused a high mortality rate (Kakkoth S. , 2004). It has led to population shrink (decrease in population density) and has posed a threat to their long survival. Therefore, governments promote exogamous marriage and people also started doing exogamous marriage (~60-65 Yrs. ago). Different kinds of marriages like marriage by purchase, marriage by exchange, and marriage by abduction are reported. Divorce and remarriage are very common.

Aranadans worship *maladeivam* (the hill god), *pakalmuthapaan* (sun, the day god), and *iravumuthappan* (moon-the-night god). Since they worship *maladeivam* therefore, they consider the whole forest as sacred. They also worship ancestral spirits. They also worship *aluroopam*- a human figurine, *tamburatti* (mother goddess), and Hindu god and goddess. Sreejisha (2014) has reported that Aranadans also worship *Kol Taiyyam*.

They also believe that the wrath of deities and spirits causes diseases (Sreejisha V. , 2014). Their birth to death ritual is connected with their religious belief and rituals have a large share in it.

2.6.2 Cholanaickan

Cholanaickan[12], also known as 'the caveman of Kerala' (Bhanu B. A., The Cholanaickan of Kerala, 1989), is one of the hunter-gatherer nomadic communities of Nilambur valley. They are residing in the interior forest of Nilambur valley. Currently, they are categorized under Particularly Vulnerable Tribal Groups -PVTGs[13] (Shri Arjun Munda, 2019) (Shaho, 2015). Previous studies have documented Cholanaickan as an offshoot of Kattunaickan (Mathur P. R., Cholanaickans of Kerala, 1977a) (Mathur P. R., Tribal Situation in Kerala, 1977b). Francis (1908) has even first time reported Cholanaickan as Shola Nayakas or Jen Krumbas of Malabar (Francis, 1908). Cholanaickan communicates in their own dialects among themselves, which consist of words from Kannada, Tamil, and Malayalam (Nair N. , 2008) (Bhanu B. A., The Cholanaickan of Kerala, 1989). Whereas, they use Malayalam to communicate with outsiders. They are distributed in the forest of both the NNFD and NSFD. Until 2001, there was no separate census data for Cholaniackar; they were included under Kattunaickan. Fig. 13 contains the demographic data (census 2011) whereas Table-I has the information on their settlement distribution.

[12] Cholanaickan is also written as Cholanaikkan or Cholanaikayan. Cholanaickanis a singular form whereas Cholanaickar is plural.

[13]Earlier PVTGs are called Primitive Tribal Groups (PTGs) (Kakkoth S. , Three Tribes of Nilambur Valley: A Studt in interrelationship between habitat, economy, society and culture, 2001). In 1975, the Government of India initiated the identification of the most vulnerable tribal groups as a separate category called PVTGs and declared 52 such groups. However, in 1993, another 23 groups were added to the category, bringing the total number of PVTGs to 75, out of 705 Scheduled Tribes spread across 17 states and one Union Territory (UT) in the country (Census 2011).

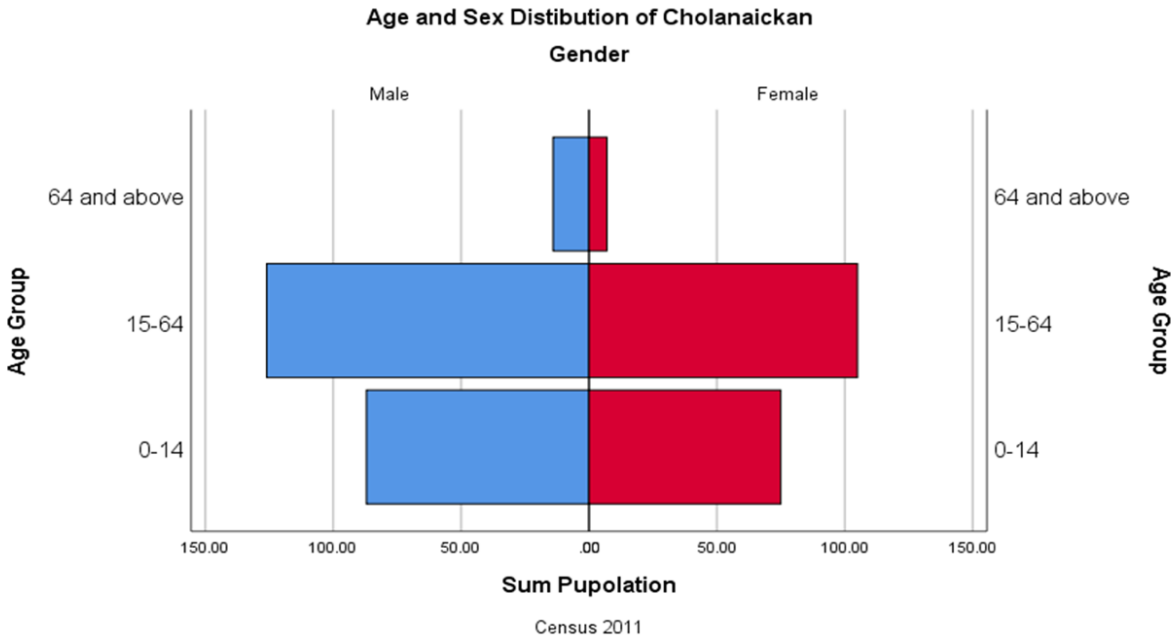

Figure 13Demographic Data of Cholanaickan Community (Created by using IBM SPSS v26)

2.6.2.1 Name and Origin

Etymologically Cholanaickan (*Chola/shola* -'forest' or ' deep forest' and *Naickan* - 'king') refers to the king of the forest/deep forest. Fuckar Ali (2009) derives the meaning of Cholanaickan (*Chola*- 'stream 'and *Naickan*- 'king') as king of the streams[14] and supported his argument with the presence of Cholanaickan *Alais* (cave) on the banks of streams. Scholars also believe that Kattunaickan centuries of geographical isolation led to the division of this community into two other subgroups i.e. Cholanaickan and Pathinaicken (*Pathi*- 'foot hills') (Bhanu B. A., The Cholanaickan of Kerala, 1989) (Mathur P. R., 1977a). As discussed earlier it is very difficult to trace the origin of the nomadic community and needs separate research, therefore, in this case, the researcher choose to go with the earlier studies. Mathur (1977a) believes that they had migrated to Kerala from Karnataka (the neighbouring state) because their dialect has a heavy influence of Kannada language. Cholanaickan refers to themselves as people who were born and raised in the forests [15]. However, there is also a parallel belief regarding their origin. Informant no. IDI-C-01-20/0315, a member of Cholanaickan, who has grown up outside the community with a non-tribal family,

[14] See Fuckar Ali (2009) PhD thesis for a more detailed analogy.
[15] A common response to their origin and nomenclature related questions during IDIs and FGDs.

narrates that they are the descendants of Cholas (one of the three powers, i.e. Chola-Chera-Pandayas, of early medieval South India). According to him their ancestry goes back to the *Badukan* and *Bahthan* (military chief) of the Chola army, who took asylum in the forest of Nilgiris, and from there they separated into two branches one came to Nilambur and the other went to the Wayanad region[16]. He also claims that in Wayanad (at *Badukan*) few Cholanaickan families are still living and they are in contact with them.

2.6.2.2 Habitats and Subsistence Practices,

Cholanaickan were and to a large extent are foraging communities. They were usually nomads or semi-nomads but currently, many of the Cholanaickan families choose to stay in colonies developed by the government. They generally move up and down along the hill along the rivulets and streams. Their mobility matrices include factors like food scarcity, life threat by wild animals, non-tribal interference in their lives, floods, and other natural hazard[17], deaths in the family, and natural calamities. Cholanaickan habitually buries their deceased member in the *alai* and then deserts the *alai* (Bhanu B. A., The Cholanaickan of Kerala, 1989) (Fuckar Ali, 2009). They quote their sentimental and emotional connection as a reason to abandon the place[18] (Nair N. , 2008). But their mobility matrices, which usually include spatial dependence, temporal dependence, relative speed, and geographic restrictions, have a pattern of seasonal migration. According to their movement patterns they mostly prefer to spend their summer in the foothills and evergreen forests of the area whereas in winter they move upward.

Cholanaickan prefers *Kallu Alai* (natural rock shelter, Fig. 14) and *manas* (leaf shelter) as their settlement. As per the information collected during the fieldwork, around 50 and above *alai* scattered in the area, which Cholanaickan used to (or still using) use as their dwelling place (Sreejisha V. P., 2014). They identify alai by the landscape feature, the significance of the area or over the name of the tree, etc. Dube (1977) has discussed 65 alai and 7 open campsites in the area (Dube, 1977). The occupancy in an *alai* is

[16] The Information was collected during the personal interview with Informant no. IDI-C-01-20/0315.
[17] During the field visit in July-August 2019 Cholanaickan colonies were heavily affected by the flood but the people of the Mencheeri colony sensed the danger the night before of the huge landslide and devastated flood and shifted to a hilltop across the river. It shows their deepest-relationship with nature and highest knowledge of their ecology.
[18] Response collected during IDIs in Mencheeri Colony

limited to mostly one to two families or one kin group. However, the government is trying to settle these communities into the colonies by building a house (Fig.15 and 16), assuring food (PDSs), and providing medical assistance. But many of the families abandoned the colony houses and moved back to earlier lifestyles.

Figure 14 Cholanaickan peoples in alai (Courtesy: Ajeeb Komachi)

Figure 15 Cholanaickan house in colonies

Figure 16 Abandoned Houses of Cholanaickan Colonies

Figure 17 Temporary Shelter of Cholanaickan

Their subsistence model includes hunting, gathering, and fishing (Bhanu B. A., The Cholanaickan of Kerala, 1989) (Nair N. , 2008). They are also actively involved in the NWFP collection and collection of medicinal plants and honey. Though hunting is very limited now due to various forest regulations and restrictions Cholanaickan still practices hunting of animals and birds for their food. Their food habits include both the plants (edible roots, tuber, leaves, fruits, nuts) and animals (monkeys, birds, terrestrial animals, fishes, crabs, and tortoises) (Nair N. , 2008) (Sreejisha V. , 2014). The use of tobacco, betel leaf, smoking, and alcohol (toddy) is very common among Cholanaickan. People of all ages and sex use tobacco. Black tea is an integral part of their culture. But like Aranadans their food habits are also changing rapidly because of multiple reasons

like (a) outreach of various developmental programs like PDSs, (b) market induced packed food culture, and (c) unavailability of natural food items and various forest restrictions.

2.6.2.3 Material Culture and Technology

Cholanaickan is undergoing a major transition in their settlement and subsistence pattern as well as their material culture. Their traditional tools are *kodali* (iron axe), digging sticks with iron spikes (*porai*), and *kokkai* (hook). For storage, Cholanaickan makes different kinds of storage containers using bamboo. For example, (a) the bamboo container used for foods is called *jenande*, (b) the bamboo container used for water storage is called *oodakutti*, and (c) bamboo basket. These communities make different kinds of baskets namely choral *kottai* and *ponikottai*. The *ponikottai* is one of the integral parts of their lifestyle because they are hunter-gatherers in practice and use *ponikottai* (Fig. 18) for non-forest wood product collection. They also use a basket for keeping their ancestral god. But with the transition the choice of their tools and utensils is shifted from traditional materials to modern materials, for example, earthen pots are replaced by aluminium or stainless steel, and traditional tools are replaced by blades and knives. Like, Aranadas they are also stated to use plastic stuff (like a bucket, chair, mugs, ropes), solar lights (Fig.19), radios, phones, electric fans, etc.

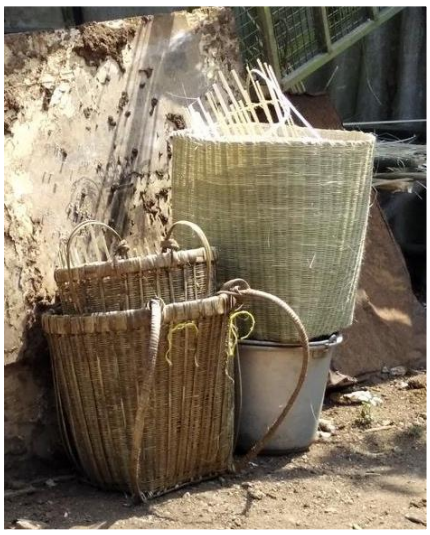

Figure 18 Basket for NWFP collection

Figure 19 Use of solar plate by Cholanaickan

Their dress and ornaments also display a transition with generations. The older generation of women mostly wears a single cloth twisted from one shoulder and covers the body parts. Few of the women wear a blouse (upper garment) and drape a piece of cloth (*selai*) as a lower garment (Fig. 14). The older generation of women also recalls the use of tree bark to cover their body parts. Whereas the younger generation of women prefers nighties and saree, as well as the small girls, choose to wear skirts and tops. Women also wear bangles (*ulla bale*) made of grass, nose pin (*ettu*), neck ornaments (*gattilakka*), and earrings. However, male Cholanaickan prefers lungi and shirts. Though they wear shirts only when they go out. The younger generation sometimes also wears pants and shirts.

2.6.2.4 Social and Religious Organization

Cholanaickan is distributed in various territorial groups called *chenman* or *tsenman*[19] (Bhanu B. A., The Cholanaickan of Kerala, 1989). One *chenman* or *tsenman* mostly has one patrilineal kin group or 5-8 families which are connected by the cooperative bond (Sreejisha V. , 2014) (Nair N. , 2008). The *chenman* is headed by the *chenmakkaran* or *tsenmakaran* or *moopan*. Trespassing the chenman is considered a

[19]Tsenman and Chenmam are also a territorial division of space, usually hills, rivers, trees, rocks etc (Bhanu B. A., The Cholanaickan of Kerala, 1989).

violation of rights and often leads to violence. The position of *moopan* is hereditary but in a few cases, the position is also occupied by adoption from close kin. The *moopan* is considered not only the political head but also the priest, doctor, and sorcerer. Earlier authors in the past have considered Cholanaickan as politically acephalous, however, researcher finds that in the current system "*moopan"* acts as a head as well as political coordinator between the community member and the nation-state.

The Cholanaickan society is patrilineal and their family is called *kudumba* which are mostly nuclear. Family is the primary socio-economic unit of society. Both men and women participate in a socio-economic activities like hunting-gathering but there is a clear division of work. Women are mostly involved in food gathering, fuel (wood) collection, and household activity whereas the men are involved in fishing, hunting, NWFP collection, etc. Though women are also actively participating in the NWFP collection. Cholanaickan social structure displays a sustainable model of resource management by the collective economy, ecological storage, and network of cooperation.

Cholanaickan is an endogamous community but in the last 30-35 Years they have started territorial exogamy. Traditionally they marry outside their patrilineal kin (i.e. outside the *chenman*) (Nair N. , 2008). Divorce is common but both males and females are permitted to remarry after the divorce. Levirate, sororate, polygamous, and polyandry are also reported (Nair N. , 2008) (Sreejisha V. , 2014). Marriage mostly happens by free choice but child marriage is also common. There are also cases of *edippiyodu* (forceful capture) and *oppamaladu* (pre-marriage sexual union).

Cholanaickan worships a number of gods and goddesses. They also believe in ancestral worship and spirits (ancestral and animal). They worship *maladiavam* (hill god), *vilakkutamparati*, zoomorphic spirits [elephant (*anauru*), tiger (*puliuru*) and ox (*kalauru*)] and *nilalu*[20]. Each kin group has a collection of images of ditties which they are keeping in the *daivakottai* (divine basket). They also worship various gods and goddesses related to health and healing, which has been discussed in another chapter of

[20] A shadow of evil spirit, which can cause illness.

the dissertation. Government has to build temple for the community, however, they do not use temple (Fig. 20) for worship.

Figure 20 Abandoned Temple of Mecheeri colony built for Cholanaickan

2.6.3 Kattunaickan

Like Cholanaickan, Kattunaickans are also a hunter-gatherer community and have their own dialects, which consist of words from Tamil, Kannada, and Malayalam. They are also listed as PVTGs (Shaho, 2015) (Shri Arjun Munda, 2019). But unlike Cholanaickan they are quietly populated and spread both widely in NNFD, NFSD, and adjacent districts i.e. Wayanad of Kerala. Their demographic data (Census, 2011) and distribution in the Nilambur valley are listed in Fig.21 and Table-I respectively.

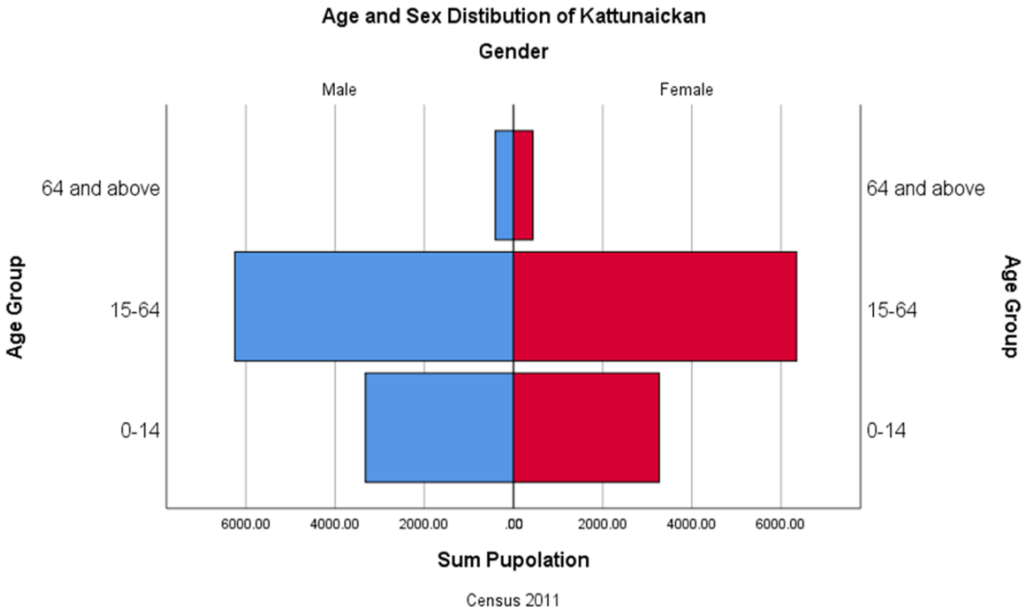

Figure 21 Demographic Data of Kattunaickan Community (Created by using IBM SPSS v26)

2.6.3.1 Name and Origin

Kattunaickan means (*kadu*-'forest' and *nayaka*- "king') the kind of forest. They consider themselves as the main community of the forest. As I mentioned earlier many authors consider Cholanaickan and Parthynaickan as an offshoot of Kattunaickans. Like Cholanaickan, it is believed that Kattunaickan migrated to Kerala either from Karnataka or Tamil Nadu. The hypothesis is based on their linguistic affinity with Kannada and Tamil.

2.6.3.2 Habitats and Subsistence Practices

Kattunaickan is a foraging community, who practices food-gathering, fishing, and microscale hunting of a few birds and animals. Just as the other tribes of Nilambur, Kattunaickan are also going through a massive transition in their settlement and subsistence pattern. Traditionally were semi-nomadic but currently, they prefer to live in a colony and their subsistence includes food-gathering, fishing and microscale hunting of a few birds and animals, NWFP collection, forest labour, daily wages, collection of medicinal plants, etc. Their food habits include tuber, fish, crabs, fruits, leaves, pork, beef, meat, rice, etc. But due to reasons like transition in lifestyle,

unavailability of roots and tubers, forest restriction, and PDS, a drastic change in their food habit can be observed. Currently, rice (*Kanni*) is the most consumed food by the community.

Unlike Cholanaickan they are not living in caves but rather they live in *mana* (mud-thatched roofs of single space without compartmentalization) and *pakka* houses (built by the government). Whereas the older people recall days when they were living in *alai* before settling in the colonies.

Figure 22 Traditional Kattunaickan of Kumbalpara colony

2.6.3.3 Material Culture and Technology

Similar to Cholanaickan, the Kattunaickan of Nilambur are also undergoing a transition phase and their possession of material culture reflects their current situation. There exists a high degree of similarities in the material culture between Kattunaickan and Cholanaickan. For example, plastic is being used in the mud-thatched roof of manas, earthen pots are being replaced by aluminium and plastic utensils, ready-made fish nets for fishing, electronic items, mobile, solar lights, etc. However, they are still using their traditional tools for NWFP collection, and hunting-gathering. As far as their dress and ornaments are concerned, both males and females wear a dress identical to Cholanaickan. Among the Kattunaickan women, orientation toward modern dress like night, saree etc. can be easily observed.

Figure 23 Material Culture of Kattunaickan Community

2.6.3.4 Social and Religious Organization

Because the majority of Kattunaickan live in colonies, the former territorial divide of chenmem is less evident, but this does not negate the significance of these boundaries. The *moopan* is the institutional head of the settlement and acts as a civic, political, judicial, and religious head (on a few occasions like during oracle practices) of the community. The post of *moopan* was hereditary but currently, the selection of *moopan* is based on age through the democratic process. On various occasions, for the post of *moopan* a serious revelry between two-person has also been observed. As per Fuckar Ali (2009), sometimes two to three settlements are also headed by the religious leader called *Mudali*. Though the family is the primary unit of Kattunaickan social organization, however, a higher degree of cooperation has been observed among the community members in terms of social roles and responsibilities, during collective subsistence activity and social care. Kattunaickan considers themselves as a higher class among all the tribes and lords of the forest, therefore, they do not receive anything from the Paniyan community, considering them as an inferior class. Like Cholaniakkan they are endogamous by cross-cousin marriage is strictly prohibited and considered as a punishable offence. Polygamy marriage is in practice and divorce is common.

As far as their religious organization is concerned, they believe in nature worship. They worship *Maladaivam* (hill god), *Nammilichi* (clan god), Nammaliedathi (mariamma-goodness of smallpox), Vaalemude Ethan (shiva), *Shimmalachi* (Parvathi), *Ganesha*,

etc. ; as shown in Fig. 24. They worship also Odiyan and Odithi (goddess) and believe in spirits and supernatural power

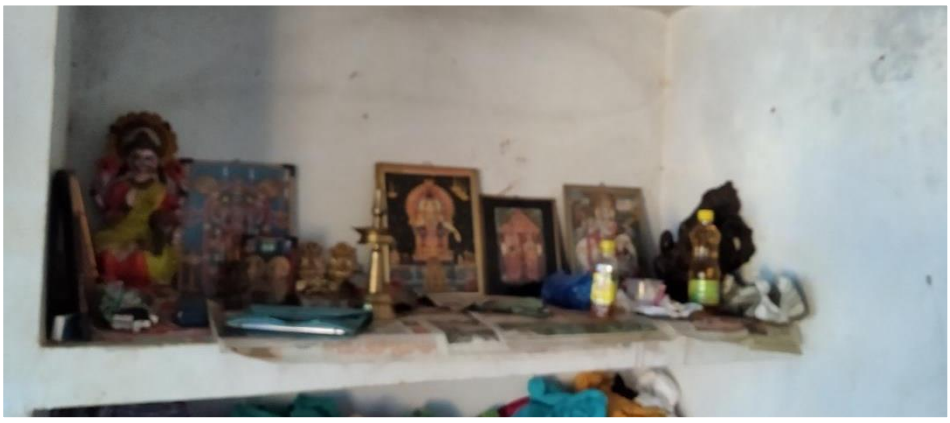

Figure 24 Hindu gods and goddesses worshipped by Katunaickan

2.6.4 Paniyan\Kattupaniyan

Kattupaniyan is a sub-group of the Paniyan community of Kerala, who live in the forest. Kattupaniyan people dwell in the forest, and their subsistence techniques differ significantly from those of the Paniyan people who live outside it. The Paniyan is the most populated tribal community out of 35 Schedule caste tribes of India. They are distributed in the Malappuram, Wayanad, Kozhikode, and Kannur districts of Kerala. Various aspects of the Paniyan Community have been discussed by multiple authors (Mathur P. R., Tribal Situation in Kerala, 1977b) (Luiz A. , 1962) (Viswanathan , 1990) (Thurston, 1909). Paniyan\Kattupaniyan of Nilambur is distributed in both NNFD and NSFD. Their demographic data (census 2011) and distribution in the Nilambur valley are listed in Fig. 25 and Table-I respectively.

2.6.4.1 Name and Origin

Kattupaniyan (*Kadu* + *Paniyan*) connotes the forest-dwelling Paniyan. According to Luiz (1962), the word Paniyan is derived from the Malayalam word *panikkaar* (labourers). Kattupaniyan are also known as Malapaniyan or Kurinpaniyan. The Kattupaniyan differentiate themselves from the main Paniyan community by calling them Nattupaniyan (*nadu*-rural or village). Kakkoth (2001) has distinct Kattupaniyan

from Paniyan based on their physical features (Kakkoth S. , 2001). Physical traits have been one of the most significant characteristics used to categorise tribal groups. However, when it comes to distinguishing Kattupaniyan from the rest of the Paniyan community, the researcher does not find physical characteristics to be an important identifier. This doesn't imply that. prior research observations are inconclusive. In terms of language (Kannada and Malayalam) and kinship structure, both the Kattupaniyan and Paniyan are very much alike.

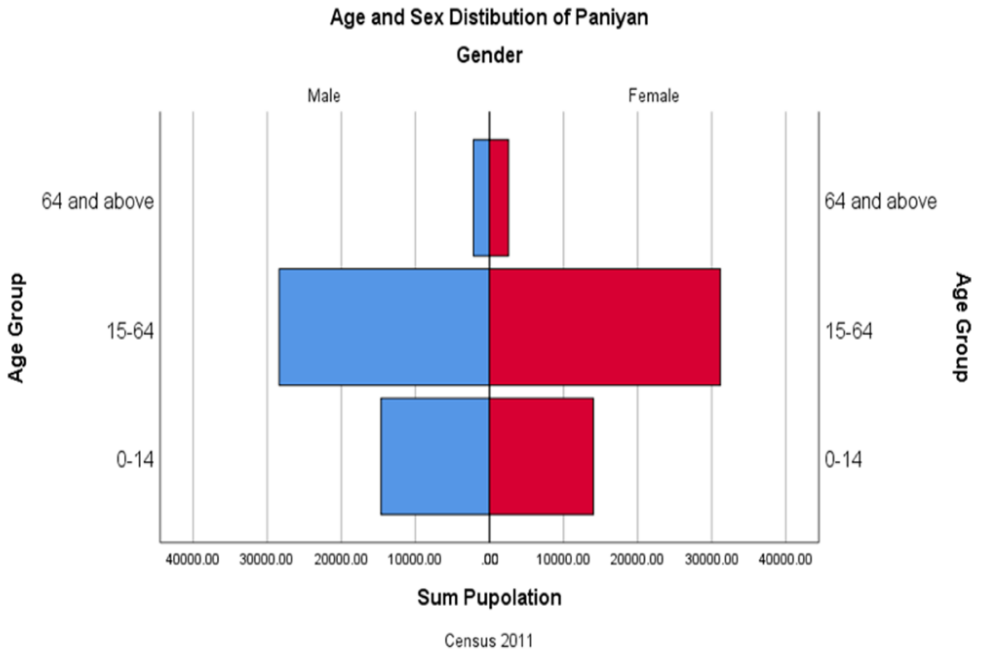

Figure 25 Demographic Data of Kattupaniyan Community (Created by using IBM SPSS v26)

2.6.4.2 Habitats and Subsistence Practices

Kattupaniyan are living in the forest ecosystem and their major part of their subsistence system is foraging but NWFP collection, Agriculture labour, Forest Industry Labour, etc. are also part of their subsistence system. Their settlements are also located on the bank of the water source. Their living space is called *pira* (Fig.27). The *pira* (traditional dwelling unit) is mostly a multi-sloped structure without a raised platform (plinth) and side walls made up of bamboo and a wallet. Mostly *pira* are single spaces without complementization but a few of the *pira's* are divided into kitchen space and living

space with side walls plastered with mud. In both, the case the cooking space is always in the corner of the house. But like any other tribal settlement, there can be seen a transition and change in their dwelling unit. The majority of the population has opted to live in the *pakka* houses provided by the government. As per old legend, before coming to the colonies the *Kattupaniyan* were used to live in *alais* (rock shelters).

Figure 26 Gold Collection from the river by the Kattupaniyan community

Unlike Paniyan, Kattupaniyan subsistence strategy is based on foraging (as already mentioned) which includes hunting, gathering, NWFP collection along with forest and agriculture labour. Few of the Kattupaniyan, especially those who are living on the bank of *Chaliyar* river are also involved in the gold collection (Fig. 26). Among selected four communities, Kattupaniyan also practices animal husbandry (goats and cows). Basketry making is also a major source of their income and sustenance. Both the man and women equally participate in the subsistence practice but there is a clear division of labour based on gender.

Figure 27 Traditional House of Kattupaniyan

As far as their food habit is considered, it includes rice, roots, tubers, fruits, leaves, messroom, fishes, birds, rabbit, porcupine, mangoes, squirrel, tortoise, etc. But with the change in their settlement pattern, environmental conditions, and landscape change their food habit has also drastically shifted. *Kanni* (received from PDSs) became the main food. Rivers and streams are the major sources of water, though government water pipelines are also widely used. Alcohol, tobacco, tea, and betel leaf consumption are very high.

2.6.4.3 Material Culture and Technology

Since foraging is the major part of the *Kattupaniyan* subsistence system, therefore, they use various traditional tools and technology like *kottu* (digging stick), *kodali* (axe), *Kuzhippara* (a stick with iron blade), knife, gold sewing wooden plate, agricultural tools, etc. Their house stuff includes utensils (earthen, aluminium, plastic), bamboo baskets, and gunny bags (as shown in Fig 29). There can be seen greater use of modern electronic items like electric fans, radio, light, solar lights, phones, and TV (especially in a few colonies on the fringe area of the forest).

Major parts of their material culture are their dress and ornaments. The older generation women prefer to wear a long piece of cloth (*udumundu*) to cover their upper and lower parts of the body and tie another piece of cloth near the waist (as shown in Fig. 28).

Whereas the new generation of women wear nightgowns and children wear skirts and tops. Women also wear saree on a special occasions or when they are going out. The female also wears a stone and bead chain and bangle. While men wear *konakom* (to cover the groins), lungi (also called *udumundu*), *puthamundu* (cover for the upper body). However, the younger generation of men prefers to wear a shirt over it.

Figure 28 Choice of Male and female dresses among Kattupaniyan

Figure 29 Material Culture of Kattupaniyan

2.6.4.4 Social and Religious Organization

Kattupaniyan is residing in the *Chenmam* headed by the *moopan*, which is a hereditary position. The nuclear family is the primary social unit but the social cohesive bond is stronger in terms of social cooperation, care, knowledge sharing, and collective foraging. *Moopan* functions as a socio-political head, healer, and sometimes ritual practitioner. They are mostly endogamous and both the cross-cousin and parallel cousin marriages are common. In a few cases, sororal polygamy is also identified. Divorce and re-marriage after divorce are frequent. There is no age restriction in marriage. Their social structure is different from the Paniyan in many ways. For example, among Paniyan, *Chemmi* or *Kootton* is the socio-political head (Viswanathan , 1990). As far as their religious belief is concerned, Kattupaniyan worships nature gods (*maladiavam*), idols and stones (Fig.30), and ancestors. They also believe in spirits and Hindu gods and goddess-like Ganesh, Shiva, etc.

Figure 30 One of the gods of the Kattupaniyan community

Figure 31 Ritual of Kattupaniyan Community

Figure 32 Ritual of Kattupaniyan Community

Part- III

2.7 The sample population for the In-depth Study

After the selection of the study population, deciding on a sample population was a critical task because of the following reasons:

a. The selected communities have no professional healer and knowledge is widespread in the community as collective knowledge but this doesn't mean that not all the people know all the medicine.
b. Knowledge of medicine is non-uniformity distributed among male and female (M&F) members of the community.
c. Its variability depends on both the socio-economic factors (like subsistence practices, division of labour, etc.) and cognitive factors (like interest, cognitive capacity, memory, etc.). People who are involved in medicinal plant collection (on a daily basis) have comparatively better knowledge and understanding and knowledge of medicine.
d. The maintenance of complete secrecy in knowledge sharing.

These factors make the identification and selection of the sample population ultra-critical. Therefore, to tackle this hypercritical problem two kinds of non-probabilistic sampling methods were used i.e. purposive sampling method and convenience sampling method. The purposive sampling method was used for the selection of the colonies, whereas the convenience sampling method has been used for the selection of the group/individual for the data collection. A total of 18 colonies ($A_{n=4,}$ $C_{n=2,}$ $K_{n=6,}$ $P_{n=6}$) were visited. The sample population includes both the male and female population with a mean age of 51.4yrs.

a. Purposive sampling method: In this sampling method the researcher has used the maximum variation in sampling, by including males and females of diverse age groups involved in different subsistence practices e.g. foraging, forest labour and other tractional subsistence practices, for greater understanding. This sampling method is useful especially when the sample pool is too small and random sampling has not been used (Etikan & et al., 2016).

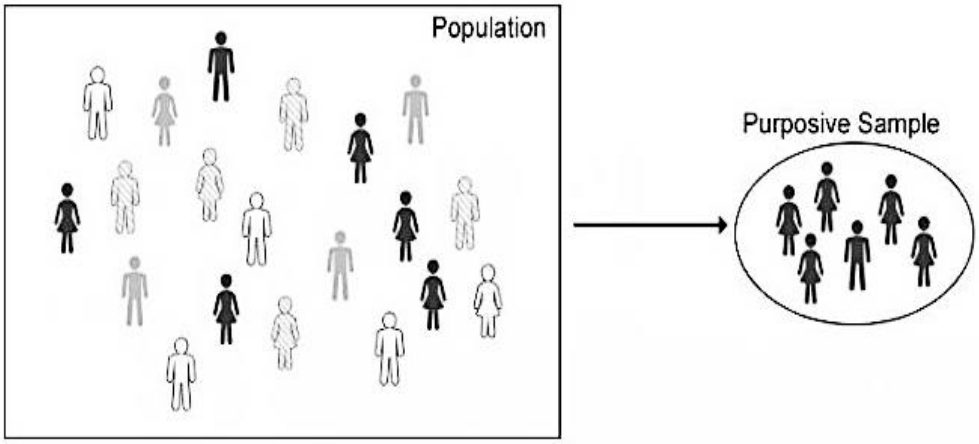

Figure 33 Purposive sampling

b. Convenience sampling method: As is mentioned above, the community people maintain complete secrecy in knowledge sharing, leaving little choice but to go with the people who are willing to participate in the process. In such a scenario, the applicability of the convenience sample method is high (Etikan & et al., 2016).

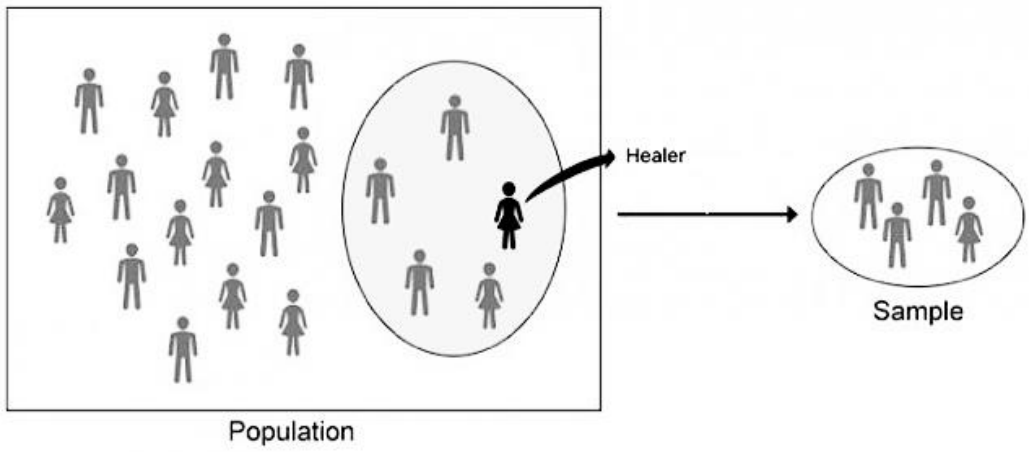

Figure 34 Convenience sampling

These sampling approaches, on the one hand, are both cost- and time-effective, and are useful in situations where meaning is generated from an intuitive approach, but they also have some disadvantages, such as

a. High level of biasness and low reliability
b. Researcher's vulnerability error in judgment

c. Inability to generalize findings

d. The possibility of under-or over-representation of the population.

Name of the Community	Name of the Settlements	Name of the other temporary settlements	Name of the Panchayat	NNFD	NSFD	Name of the forest Range	Selected Colonies
Aranadan	Poovathipoil		Vazhikkadavu	-N/A-		-N/A-	
	Chakkappadam						
	Thekkepalad						
	Panampatta		Moothedam				
	Palengara						
	Poolakkapara						
	Theekkadi						
	Kottupara		Karulai		-DO-	Karulai	✓
	Vellikketu						✓
	Olarvattam		Amarambalam				
	Chokkad		Chokkad			Kalikavu	✓
	Adakkakundu		Kalikavu				
	Alakkal	Mannal, Panapuzh, Nagmala, Enikkol, Kuttankallu,	Vazhikkadavu	-DO-			✓
	Punchakolly						✓
	Anchala		Amarambalam			Kalikavu	
	Mancheeri						✓

Cholanaickan		Kuttankallu, Kuppanmala, Puchapara, Meenimutti, etc. [The list of temporary settlements was adapted from Sreejisha P (2014) PhD thesis]	Karulai		-DO-	Karulai	
Kattunaickan	Appankkappu		Pothukal	-DO-		Vazhikkadavu	✓
	Thandankallu						✓
	Chembra					Nilambur	✓
	Ettapara					Vazhikkadavu	
	Kumbalpara					Nilambur	✓
	Mathippoti			-N/A-		-N/A-	
	Punchkkolli		Vazhikkadavu	-DO-		Vazhikkadavu	✓
	Vettilakolly						✓

	Palakkayam		Chaliyar		-DO-	Edavanna	
	Thotappalli					-N/A-	
	Pattakkarimbu		Amarambalam			Kalikavu	✓
	Chenappadi		Chokkad		-DO-	-N/A-	
	Pattanitharissu		Kalikavu		-DO-	Kalikavu	
Kattupaniyan	Iruttukuthy		Pothukal	-DO-		Vazhikkadavu	✓
	Vaniyampuzha						✓
	Tharippapotty		Pothukal			Vazhikkadavu	✓
	Vettilakolly		Akampadam	-DO-		Edavanna	✓
	Ambumala						✓
	Kalunda						✓

Table 2 Placement and Distribution of Selected Colonies

2.7.1 Selection and Withdrawal of Subjects

2.7.2 Inclusion Criteria

- The present study include people of STCs who are nomadic or settled in the colonies inside the forest as well as the residing fringe area of NNFD and NSFD.
- Individuals (male and female) above the age of 18 years are be included in the study.

2.7.3 Exclusion Criteria

- Urban settlements of the STCs are be excluded from the study.
- Children are excluded from the study because they are not involve in healing practice.
- Individuals who are unwilling to participate and share the information are also excluded from the study.

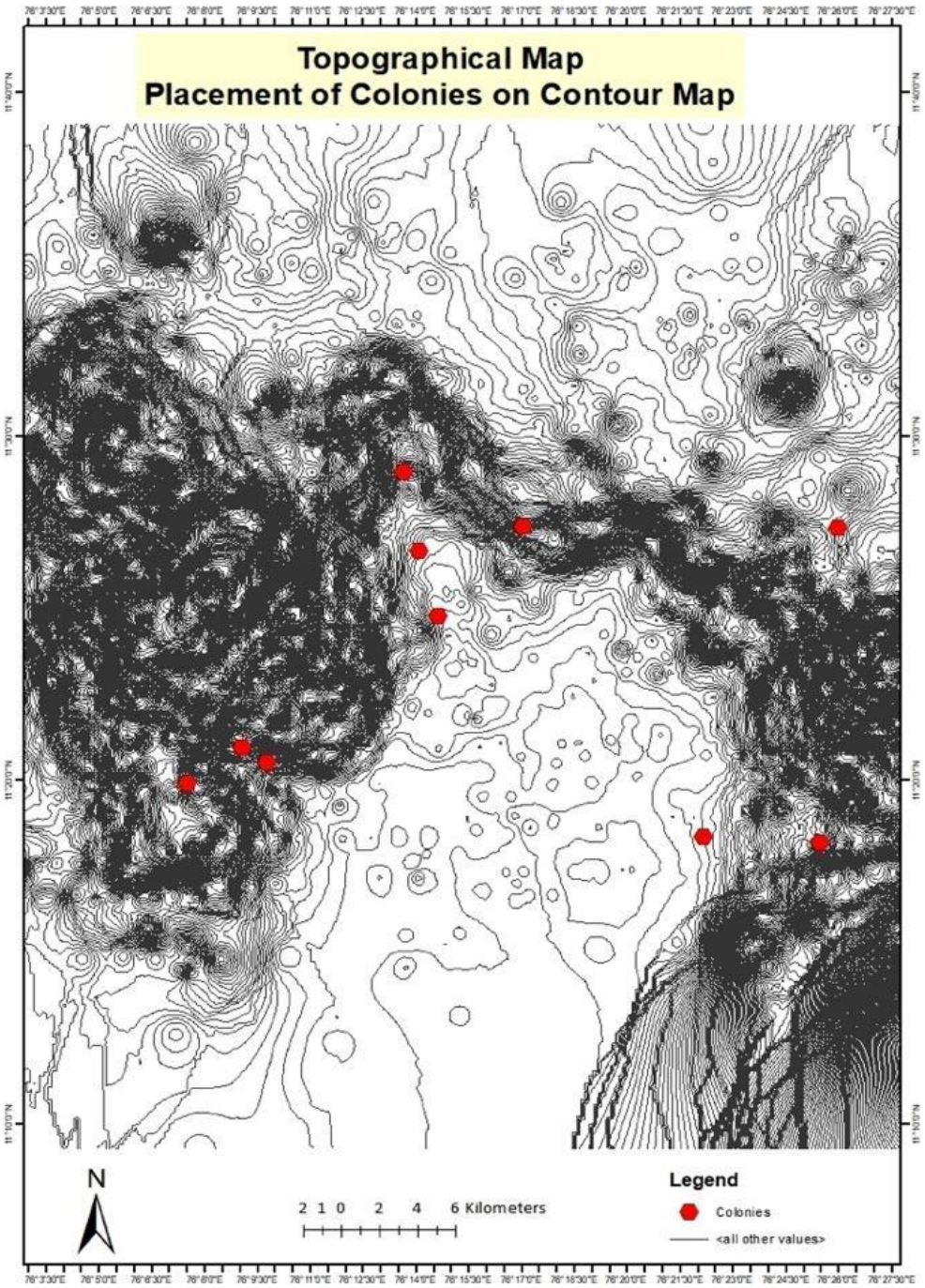

Figure 35 Toposheet Map of Study Area

2.8 Data Collection

The most important part of any research is data collection. It permits researchers to study the research goal and then present their findings. The data for this study was

acquired through a series of rigorous processes including a variety of methods and tools. The focus of the discussion was on the participants' perceptions of traditional healing procedures and their experiences with them.

2.8.1 Sources of Data Collection

The data was collected primarily from three sources i.e. primary, secondary, and observation. The primary data was collected in the form of in-depth interviews, focused group discussions, and survey data, whereas for secondary data texts and photos have been referred. Observation of individual and collective behaviour in real-life settings was also an important data source. The observation was mainly uncontrolled quasi-participant observation[21]. The details of the data sources are displayed in Fig. 36.

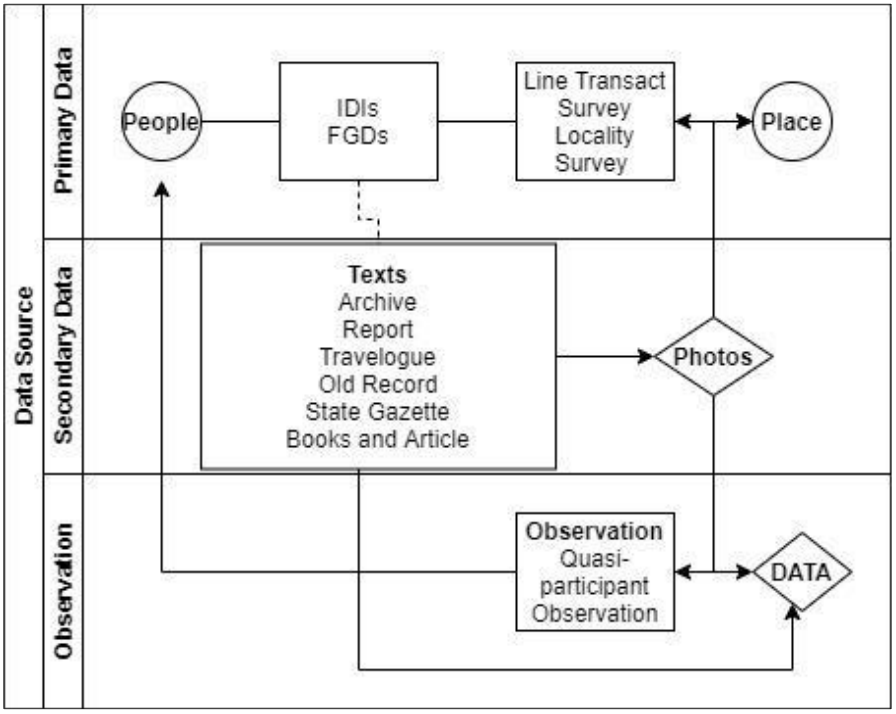

Figure 36 Flowchart for Source of Data Collection

2.8.2 Data Collection Methods, Tools, and Techniques

The data were collected with the application of the mix method. It contains both quantitative and qualitative data. Total 18 colonies ($An_{=4}$, $\mathbf{C}_{n=2}$, $\mathbf{K}_{n=6}$, $\mathbf{P}_{n=6}$) were visited

[21] Quasi participant observation method is a type of observation method This method is used in the field in a situation where researchers' direct and complete participation is not possible in community activities. For example, rituals. **Invalid source specified.**

between December 2019 and March 2020. The schematic diagram (Fig 37) and Table -I give an overview of the method and methodology and a list of visited colonies respectively.

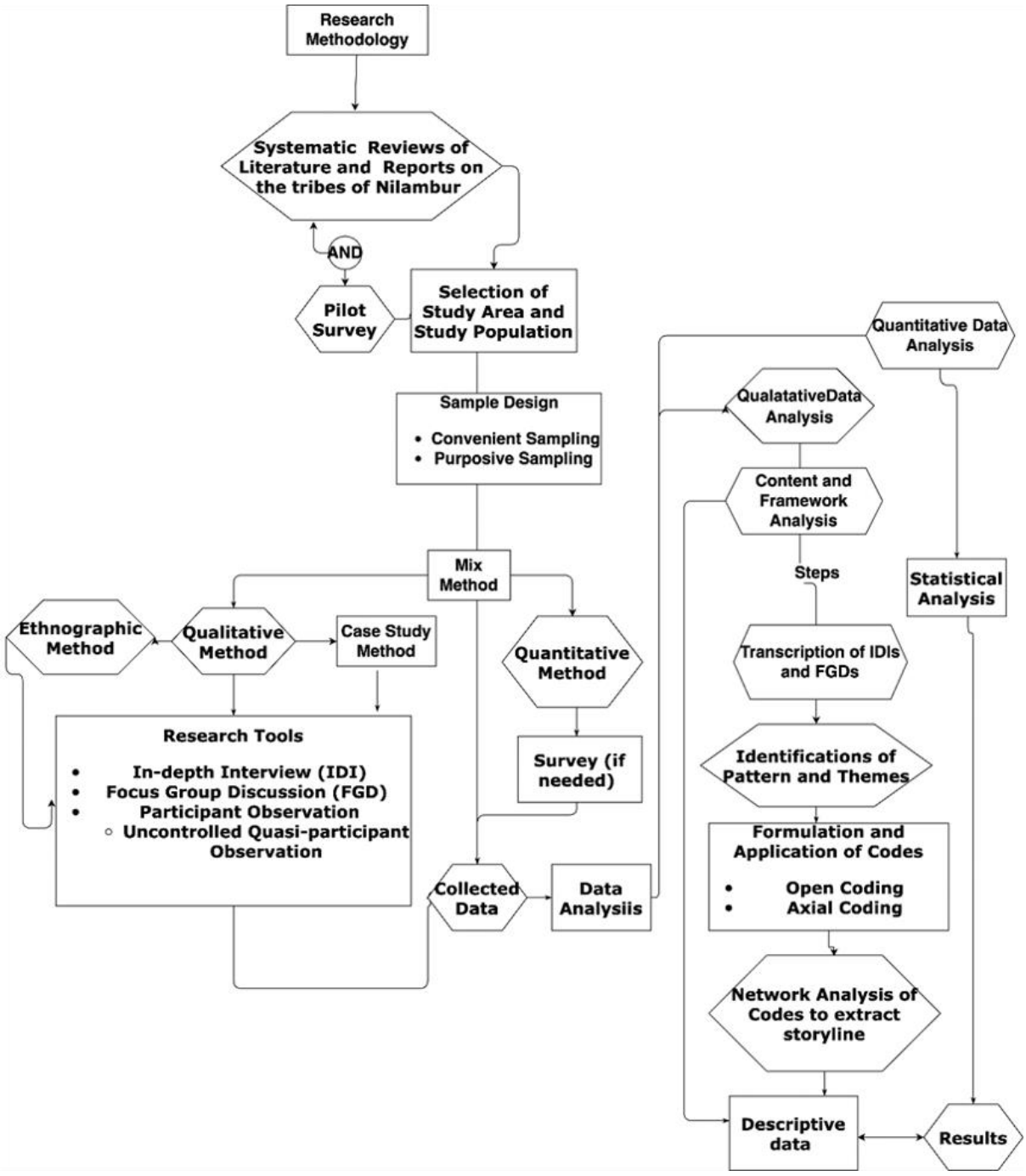

Figure 37 Flowchart of research method and methodology

2.8.2.1 Qualitative Data:

The qualitative data were mainly collected through the ethnography method and case study method (Fig. 38). It includes primary data source, secondary data source, and observation.

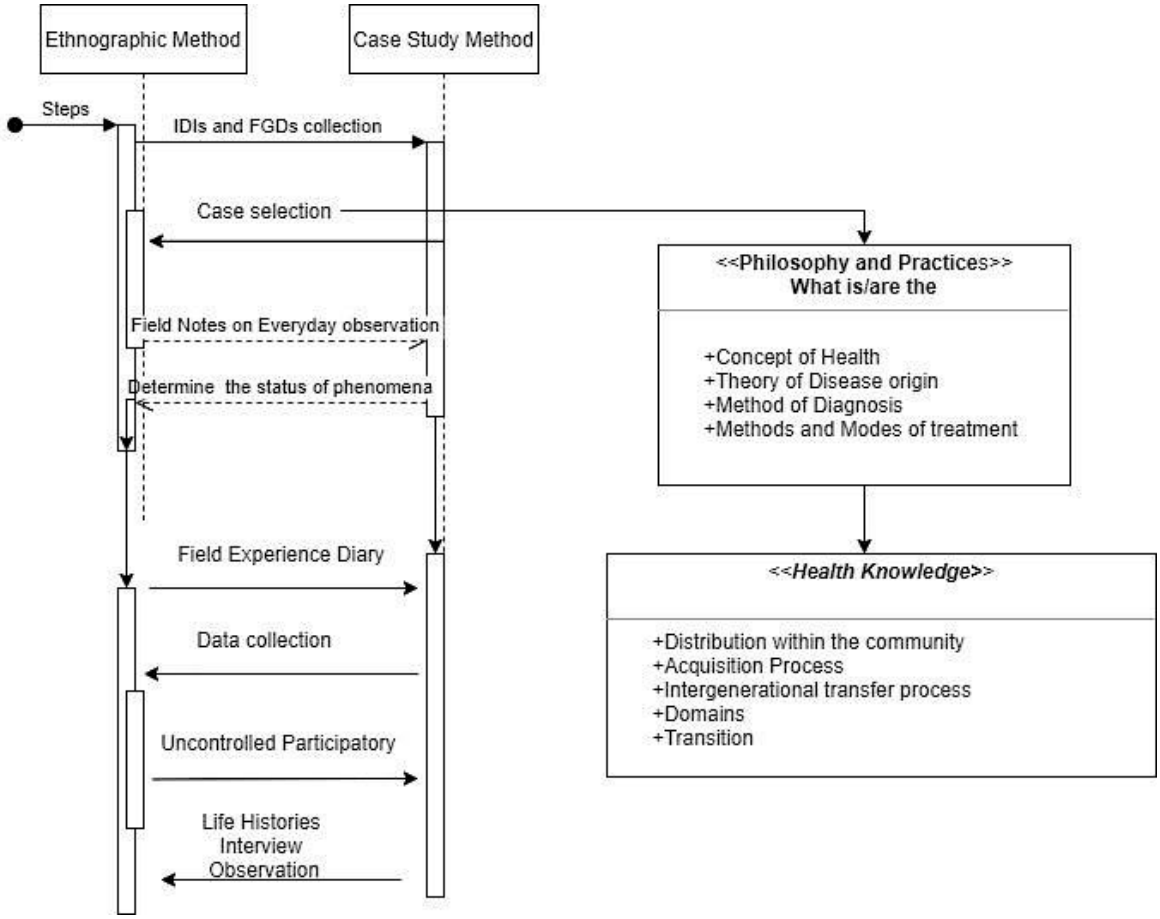

Figure 38 Flowchart for qualitative data collection method

2.8.2.1.1 Ethnographic Method

The ethnographic method was applied to gather symbolic and contextual meanings of the everyday practices in their natural setting. Total 26 IDIs ($A_{n=4,}$ $C_{n=2,}$ $K_{n=10,}$ $P_{n=10}$) and 6 FGDs ($A_{n=1,}$ $C_{n=1,}$ $K_{n=2,}$ $P_{n=2}$) were collected. IDIs and FGDs were collected with the help of semi-structured and open-ended questions. The Fig.39 contains the gender wise

data {Female : 6 ($A_{n=2,}$ $C_{n=1,}$ $K_{n=2,}$ $P_{n=1}$) / 26 (IDIs) & 2 ($A_{n=1,}$ $C_{n=1}$) / 6 (FGDs) and Male: 20($A_{n=2,}$ $C_{n=1,}$ $K_{n=8,}$ $P_{n=9}$) / 26 (IDIs) & 4 ($K_{n=2,}$ $P_{n=2}$)/ 6 (FGDs)} collected in each of the selected communities.

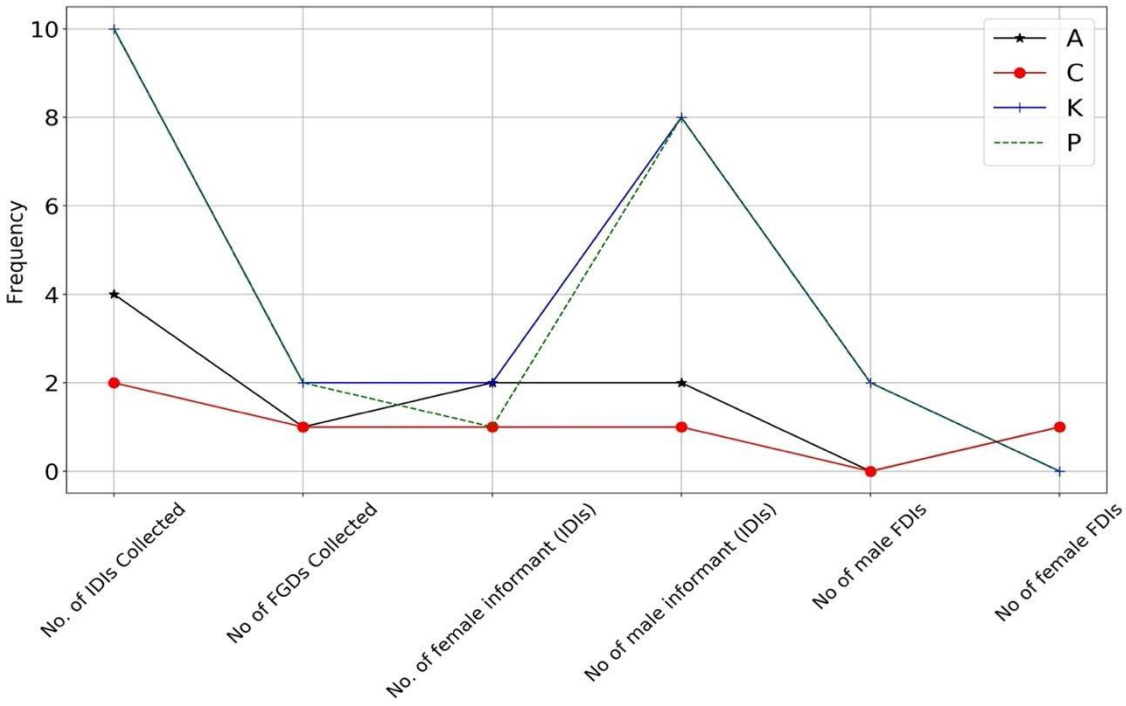

Figure 39 Graphs for collected data (Gender wise)

The FGDs have an average of 6-7 respondents, mostly men and a few women, and the age of the group were between 45-65yrs. Whereas, secondary data is collected from government reports like the Integrated Tribal Development Project (ITDP) reports, Kerala Forest Department (KFD) report, Grama Panchayath offices data, Census records, and previous research. It is important to note that the question that was used in data collection, was based on four basic themes i.e. general question (informant background), information on the diseases and safety, information on the treatment method, and information on the medicinal plant and their uses. Following were the cues used in the questions to extract information.

Cues in Question	**Example**
General question	What do you do for a living?

Specific question	When was the last time you fell sick?
Guided tour question	Can you show me the plant used for headaches?
Example based question	When I was recording an interview in the *Kumbalpara* colony among *Kattunaickan*, they told me that they are using *Amalpuri*leaves for a snake bite; do *Cholanaikkan* of *Alakkal* also use the same plant for the same purpose?
Experience-based question	When you were in the field and you got injured, what did you do?
Hypothetical question	If a 2-3 years old child is brought to you, who can't say their sickness problem; in that case how do you find out his/her illness.

Table 3 Cues Used for data collection

Apart from the IDIs and FGDs, observation was an important source of data collection. The observation was uncontrolled observation i.e. observation made in a natural environment without being influenced by outside or external factors. The observation and empirical field text were principally collected in the form of quasi-participant observation. The reason for opting for the above mention observation method is as follows:

a. It has the merit of both the participant and non-participant observation which gives the freedom to act as an observer and participator at the same time.
b. Being a linguistic alien restricts full participation because of the communication barrier
c. Few of the activities required prerequisite conditions like essential training and previous experience. This also had limited the full participation in various activities like honey collection
d. Maintenance of complete secrecy in information sharing

Note: The tools are used in data collection are enlisted in Table-3

2.8.2.1.2 Case Study Method

The case study method was applied to do a cross-cultural comparative study of health and healing methods and models, food habits, and the use of medicinal plants among the selected communities. The data gathered from this approach will help in model development for a future approach towards an indigenous community in general and their health and knowledge in particular.

Types of data	Research tools	Tools used to collect data	Purpose of tools
Qualitative	In-depth, interviews and Focused Group Discussion	Audio recorder	To record the interview for transcription and future data analysis (especially video recording)
		Digital camera and Mobile camera (Photo and Video recording)	
		Semi-structured questionnaires	
	Observation	Notebooks, Logs, and dairies	To record the experience and empirical field text
Quantitative	Survey	Spreadsheet	Demographic and other survey data
		GPS	For taking coordinates, elevation, and line-transect survey (for making a 3-D model of the Area)

		Scale	As a measurement tool for recording material culture.

Table 4 Tools and technologies used for data collection

2.8.3 Quantitative Data

Quantitative data are predominantly collected through surveys but some of the qualitative data were also converted into quantitative data for analysis. (Details for the data conversion are discussed in the subsequent section and Fig. 40). The survey method was used for demographic data, socio-economic data and line-transect survey data. The line-transect survey was conducted during the guided tours of the subsistence area. This survey was useful to develop the study area maps, contour map, 3-D model of the subsistence area, and understand the landscape change (Fig. 41). The maps and models were developed by the data collected through GPS and remote sensing software like Google Earth Pro, USGS, Earth Explorer (NASA), and Bhavan. Whereas the maps and models were created with the help of software viz. ArcGIS 10.7.1, ArcScene 10.7.1, QGIS 3.4 etc. Following are the steps for the creation of maps and models.

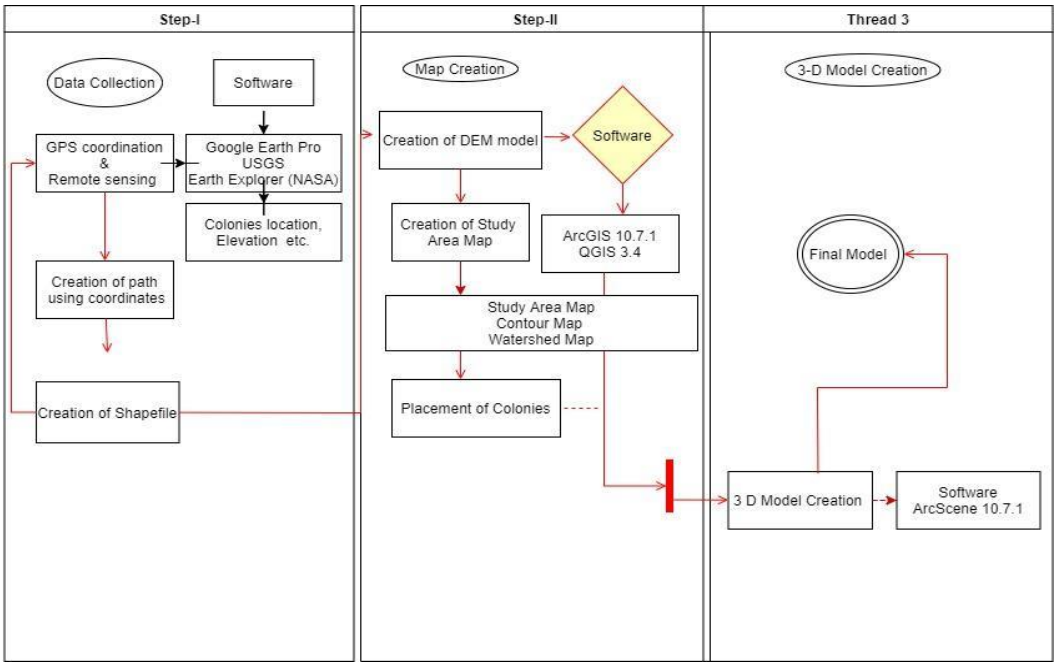

Figure 40 Flowchart for creation of the 3-D model of the Study Area

Figure 41 3-D Model of the line-transect survey of subsistence area of the selected communities (Created by using GPS data, USGS, ArcGIS 10.7.1 and ArcScene 10.7.1)

2.9 Data Analysis

The data analysis in this study progressed from open coding to the establishment of themes and sub-themes. Themes and sub-themes were categorized into broad categories, the majority of which were self-evident given the study's emphasis and research objectives. Each transcript was read twice to acquire a thorough comprehension of the data, with some being read more than two times due to the breadth and depth of the participants' experiences with traditional therapy. Throughout the reading process, memo notes and personal notes were taken about the themes that arose from the transcripts.

2.9.1 Qualitative Data Analysis

To interpret the collected qualitative data, an abductive approach[22] (Lipscomb , 2012) was undertaken. The data was (after the multiple revisiting and shorting) analysed through the following steps:

I. **Step-I**: Transcription of interviews in textual form. But it is important to note here the interview was recorded in Malayalam and H-G communities' native language and was later translated and transcribed into English.

II. **Step-II**: Content Qualitative data analysis by using content (Shannon & Hsieh, 2005) and framework analysis method (Parkinson & et al. , 2015). It comprises the following sub-steps.

1. **Sub step-I**: *Identification of pattern, connections, and themes*: The words and phrases are related to H-G communities' conception of health, recognition, and categorization of diseases (serious and serious diseases), method of diagnosis, knowledge of medicine, the decision-making process for the section of medicine, and mode of treatment.

[22]It starts with an observation or set of observations and then seeks to find the simplest and most likely conclusion from the observations. This process, unlike deductive reasoning, yields a plausible conclusion but does notpositively verify it.

2. **Sub Step-II:** *Formulation and Application of Codes*: Two types of coding methods were used. The codes were assigned manually in the software (Nvivo 10.6 and ATLAS.ti 7.5.16) after several rereading of a transcript.

   A. *Open coding*[23]: It is useful in determining the frequency of ideas, words, and themes; and similarities and dissimilarities in the practices, worldviews, beliefs, etc.
   B. *Axial Coding*[21]: This coding method is helpful to identify the interconnection and link between ideas, themes, words, and open codes; to map the shift of content, and to see the overall emerged pattern.

   Note:

   I. The old photos that were collected in the course of the pilot study, archive search, and meeting with people, were also coded using the same software and similar method.
   II. The information obtained from the method is used in the consecutive chapters of the dissertation.

III. **Step-III**: Data comparison- After doing systematic coding of data (IDIs and FGDs), all the abstract codes/categories were compared with field notes of passive observation, secondary data, and literature reviews to verify the exactitude of interpretation and internal reliability of codes.

2.9.2 Quantitative Data Analysis

Quantitative data were analysed in two parts i.e. Part-A and Part-B. Part-A consists of demographic and socio-economic data. This was gathered from household surveys and reports. The demographic data and socio-economic data were analyzed by IBM-SPSS v.26. It was used for preparing population charts, cross-cultural comparative graphs, and statistical analysis.

[23] [38]

Whereas, Part-B includes the data that was converted from qualitative data (to quantitative), which was gathered from IDIs, FGDs, and literature review (Fig.42). For example, during IDIs and FGDs, the respondent frequently mentions the name of a medicinal plant, diseases, food items, etc. These kinds of data were converted into quantitative data

i. Step-I: Data Preparation

a. The qualitative data are extracted from the text in the form of tables or charts.
b. The values were assigned to the respective rows and columns based on their categories. For the data that was created in matrix format, binary values (0 and 1) were assigned. Whereas for other kinds of data charts, frequency values were assigned (natural numbers i.e. 1,2,3,4, 5,….).

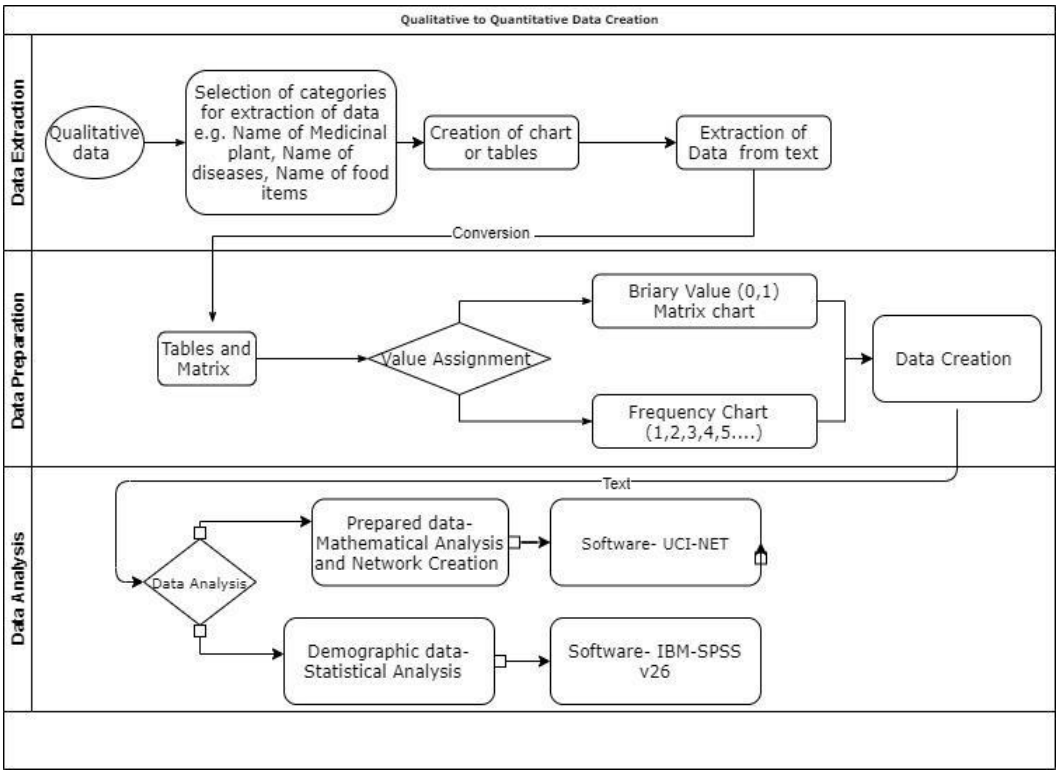

Figure 42 Flowchart for the conversion of qualitative data into quantitative data

ii. Step-II: Data Analysis

The matrix data were analyzed by using UCI-Net (software) to identify and visualize links, networks, and similarities in the uses of medicinal plants, food, etc. among the selected communities. The results of the data were used in chapters 3, 4, and 5.

2.10 Ethical Consideration

The researcher had duly taken the permissions from the Scheduled Tribe Development Department (D3-19920/19) Thiruvananthapuram, India, and Department of Forest, Government of Kerala (KFDHQ-5757/19-CWW/WL10) Thiruvananthapuram, India. The Informant agreed to voluntary participation and informed consent was obtained from all the individuals before data collection.

An informant consent form and participant information (in Malayalam language and English language) explaining this study to participants and providing adequate information about this study will be circulated and consent will be been taken before the data collection. It is important to note that the consent form will be read out and explained to the informant if the participant does not know how to read it. This consent form will be signed by the informant, and the researcher is designated to obtain consent. Researchers will ensure that observations, interviews, recordings, and surveys are conducted in a manner that protects the privacy and safety of the participants.

The study aims to document the indigenous healing traditions of Selected Tribal Communities of Nilambur valley, Kerala (STCs) within the cross-cultural context and conceptions of health and disease. Focus group discussions and interviews with key informants will be conducted with proper consideration of the respondents' privacy and other specific requirements.

Ethical considerations for this study include the following:

- Adequate information related to research (how the collected data will be used for the study) will be provided to participants so they know what participation entails.
- Research participants should not be subjected to harm in any way whatsoever.
- Full consent will be obtained from the participants before the study. And all consent forms will be made available in Malayalam and English and all data will

be only collected after the consent, so participants are fully aware of what they are signing up for.

- The consent form will be read out and explained to the informant if the participant does not know how to read it.
- Respect for the dignity of research participants will be prioritised.
- The protection of the privacy of research participants will be ensured.
- An adequate level of confidentiality of the research data will be ensured.
- To ensure confidentiality, the researcher will provide each informant with an informant ID number in order to protect their identity, and the obtained data will be managed alone by the researcher. The researcher will collect data in a natural setting, such as a forest or closed-door room, with a limited number of people who are required for the interview. The acquired data will be securely and safely saved in the researcher's own computer for the purposes of the current study.
- The anonymity of individuals participating in the research will be ensured.
- The researcher will ensure that the informant's everyday routine is not hampered throughout the data collection procedure. For example, the researcher will make a prior appointment with the informant in his or her spare time so that the informant's daily routine is not disrupted.
- Any deception or exaggeration about the aims and objectives of the research will be avoided.
- Affiliations in any form, sources of funding, as well as any possible conflicts of interests will be declared.
- Any type of communication in relation to the research will be done with honesty and transparency.
- Participants will be informed that their participation is voluntary, and they will not be held responsible if they choose not to participate at any time.
- Information on the belief system will be kept confidential, and informants will remain anonymous. The researcher will be culturally sensitive to the obtained data and will not be published or present researchers' understanding of the belief system without consent and cross-verification with the respective informant.

CHAPTER 3: HEALTH AND HEALING PRACTICES

3.1 Introduction

The previous chapter has elaborately discussed the brief background and position of the researcher, opted methods and methodology for this research, selected study area, study population, and ethnographic profile of STCs. This chapter will look at various aspects of STCs' perception of health, healing practices and how the underlying systemic structure of healing practices functions and effetely deliver healthcare to its members. It will, in a nutshell, respond to the first and second research questions.

I. What are the healing techniques and methods used by the Selected Tribal Communities of Nilambur Valley, Kerala (STCs)?
    d. What are the methods of disease recognition?
    e. What are the methods of diagnosis for diseases?
    f. What are the methods of treatment for diseases, injuries and traumas?
    g. What are the modes of treatment?
II. What forms of medicine or therapeutic remedies are used for the healing practices by the STCs?

This chapter begins by looking briefly at the possible situations that make STCs vulnerable to various kinds of diseases or illnesses, the STCs' concept of health and healing, aetiology or theory of diseases causation, the diagnosis system, and the technique of appropriate therapy. The chapter concludes by categorising STCs' healing practices into two conceptual categories: recursive and idiosyncratic, which were developed after examining STCs' healing techniques (as data presented).

3.2 Identified Possible Vulnerability Conditions for Ill-health among STCs

STCs are family-level foragers and hunters with low population density, and their socio-cultural traits exhibit an informal and flexible social relationship between families, as discussed in earlier chapters. STCs are (and have been) prone to various diseases and ailments as a result of their subsistence methods. The following are examples of settings

that could make STCs vulnerable to infections or illnesses (Fig. 43). The following potential vulnerability conditions for illness were found during fieldwork (as an observation) and data analysis.

(a) Interactions with or exposure to hazardous plants, animals, insects, and parasites while foraging or gathering wild plants, hunting, bringing prey home after hunting, and consuming infected prey\food.
(b) Seasonal change and variation in temperature
(c) Change in food habits
(d) Natural hazards: floods
(e) Zoonotic diseases: bites from insects, animals, snakes and other organisms
(f) Accidents and injuries
(g) Supernatural cause

It is important to note here that Fig. 43 briefly summarize how each identified possible diseases vulnerability condition is interrelated and can affect not only the individual but also the family and community. In addition, while conducting literature reviews, it was found that prior research also shared several of the identified potential susceptibility conditions for diseases or illnesses among STCs, such as a high risk of contracting infectious and contagious diseases. Scholars, for example, have written extensively about the Kyasanur Forest Diseases Virus (KFDV), which affected Cholanaickan people in the Nilambur Valley in 2014 (Jayarajan 2014). KFDV is a Flaviviridae virus that spreads among the Cholanaickan population after being bitten or coming into contact with an infected monkey, particularly a sick or recently deceased monkey (Tandale et al., 2015) (Jayarajan 2014). Jayarajan (2014) further stated that KFDV's reach is not confined to a particular age group or gender but people of all ages and genders are susceptible to the disease. It is, therefore, essential to note that STCs are (were) vulnerable to infectious diseases and contagious diseases, despite their low population density, regular changes in habitational sites, and a clear division of labour (adult males\females being foragers\hunters, younger and older adults as consumers). Why is this the case? Is it, for example, because of their complex social network of sharing and consumption-production model? And, assuming that's the case, how do complex social networks function as a disease lug?

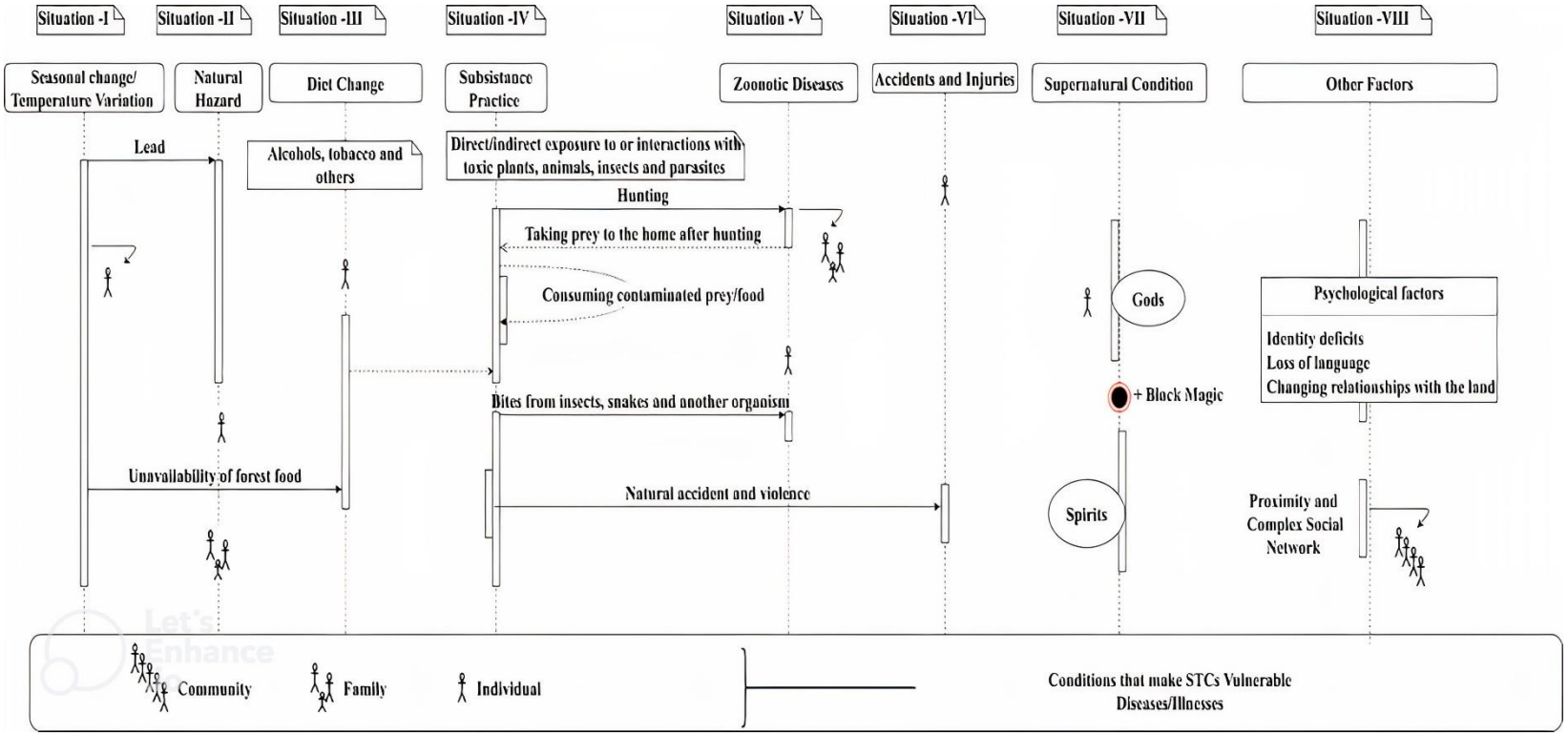

Figure 43 Identified possible vulnerability conditions for diseases or illnesses among STCs (Created using Draw.io).

All of the above-mentioned questions are crucial, and they are addressed in further detail in the following sections. However, because there is a near-complete absence of health data on STCs, it is difficult to determine to what extent STCs are exposed to diseases caused by the scenarios listed in Fig. 43, such as subsistence practices, and changes in food preferences, contact with animals, supernatural causes, etc. Despite a near-complete absence of health data in records, the study, in the form of empirical data, has found that STCs frequently discuss illnesses or diseases caused by situations discussed above such as supernatural power, interactions with animals during subsistence practices, changes in dietary habits, seasonal changes, etc. Although it is possible that it might not claim many lives or have substantial physical or psychological impacts, it is more likely that these conditions affect adults and productive members of the community, with serious economic and health consequences. It is important to highlight that Fig. 43 also includes accidents and injuries, which are common occurrences among STCs and have a substantial impact on their health.

Here are a few extractions from the IDIs and FGDs (of STCs) in which the informants have mentioned some diseases or illnesses transmitted from animal to human. It is important to note that, to protect the informants' anonymity, each of them has been assigned a unique identifier, which is based on the following parameters: *Mode of data collecting (IDI or FGD)-Serial No (of collection) -Acronyms for the community's name -Year\MonthDate.*

< <Internals\\Interview Transcript\\FGD-C(1-4)-01-20\0314 > - § 1 reference coded [0.52% Coverage]

Reference: Diseases caused by parasitic transferred from animal to human

Person1: "Chellu" (Tick, Lice) form deer transmitted to humans. It causes itching and fever. It affects people in the forest[24].

[24] Informant No FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.

<Internals\\Interview Transcript\\FGD-K(1-5)-01-20\0112 > - § 1 reference coded [1.61% Coverage]

Reference: Snakebite and Dog bite

Person 5: No. We will simply tie up above the bitten area. The poison will never affect other body parts. I got snake bites several times[25].

Person 5: yes, I suffered from snakebites more than ten times. Do you see this mark? The dog left a nasty bite on me. I didn't use any medicine[26].

<Internals\\Interview Transcript\\IDI-K-01-19\1230 > - § 1 reference coded [1.92% Coverage]

Reference: Monkey fever

……. we got monkey fever(kurangu pani in Malayalam) 5 years ago[27].

<Internals\\Interview Transcript\\IDI-K-05-20\0313> - § 1 reference coded [0.56% Coverage]

Reference: Monkey fever

…… 'Cholanaikkan' and we used to eat monkeys earlier. So people got monkey fever from the monkey[28].

---

[25] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[26] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[27] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[28] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

It is important to note that STCs have their own model of disease classification and theory of disease causation or aetiology, which differs from the allopathic or other popular or professional healing traditions' classification categories. However, STCs frequently refer to the experience of illnesses that have often been described in other popular or professional healing systems, for example, fever (*Cheerappu\Pani*), headache (*Ubbukuthal\Thalakuthu\thalavedana*), fever and cough (*Pani and Kura\kemmal*), malaria (*Virayalpani*) stomach ache (*Oddabaruthu\Pallavedena*), dysentery (*Oddalukachathu\Chorathooral*), worm infection (*Oddavu\Erasalyam*), snakebite (*Pambukadi\Avumaddu*), dog bite (*Penaykadi\Nayakadi*), wounds (*Murivu\Murioddu*), Scorpion sting (*Chekumaddu*), indigestion (*Oddambal\Pallasthambhanam*), cholera (*Karalumthooralum*), vomiting (*Karal\Mesaddu*), eye infection (*Kanuubaruthu\Kannupazhuppu*), toothache (*Alluvedana\pallunoythechu*), earache and infection (*Kevivedana\Chevivedana and Kevipazhuppu\Chevipazhuppu*), infection from tuber poison (*Kattu*) etc. Below are a few extracts from the IDIs and FGDs (of STCs) that contain the name of diseases or illnesses.

<Internals\\Interview Transcript\\ IDI-C-01-20\0315> - § 1
reference coded [0.11% Coverage]

……fever(Pani), headache (thalavedana) and snakebite (Pambukadi)[29]

<Internals\\Interview Transcript\\ IDI-K-03-20\1501> - § 2
references coded [1.43% Coverage]

.....headache (thalavedana), fever (Pani), urinal pain, leg and hand pains and all bone pains. These are common health problems among people living here[30].

[29] Informant No. IDI-C-01-20\0315 has responded during the IDI among the Cholanaickan community.
[30] Informant No IDI-K-03-20\1501has responded during the IDI among the Kattunaickan community.

.....headache, fever, joint pains and all. If any small snake bites(Pambukadi), we can cure them. But high poisoned bite, we couldn't do anything[31].

<Internals\\Interview Transcript\\ FGD-K(1-6)-02-20\0204- § 1 reference coded [3.03% Coverage]

Person 3: usually get a fever(Pani) and headache (thalavedana)[32].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20\0314> - § 2 references coded [0.53% Coverage]

Person 3: Fever (Cheerappu) is common here[33].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112> - § 1 reference coded [0.99% Coverage]

Person 2: Fever (Pani), stomach pain (Pallavedena), headache (thalavedana), body pain, leg pain, etc[34].

Person 5: mainly, we are facing skin diseases. (They showed the right arm of a person who affected skin diseases)[35].

<Internals\\Interview Transcript\\ IDI-K-01-19\1230> - § 2 references coded [0.58% Coverage]

*.....Diarrhoea, Fever(Pani), headache(thalavedana), vomiting (Karal) and tooth pain(*Alluvedana*)*[36]

<Internals\\Interview Transcript\\ IDI-K-04-20\0202> - § 1 reference coded [1.06% Coverage]

[31] Informant No IDI-K-03-20\1501 has responded during the IDI among the Kattunaickan community.
[32] Informant No FGD-K(1-6)-02-20\0204 has responded during the FGD among the Kattunaickan community.
[33] Informant No FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[34] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[35] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[36] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

.....fever (Pani), cold and sore throat etc. If kids get a fever we go to the hospital[37].

<Internals\\Interview Transcript\\ IDI-C-02-20\0316> - § 12 references coded [6.72% Coverage]

*Stomach pain(Pallavedena), headache(thalavedana), cold and fever(*Cheerappu*) are common diseases*[38].

<Internals\\Interview Transcript\\ IDI-K-05-20\0313> - § 1 reference coded [0.43% Coverage]

....headache(thalavedana), fever(Pani), cough and loose motion we treat ourselves[39].

Fig.44 rough out the frequency of a few frequently mentioned diseases (as an example) by STCs. The results in the table reveal that STCs are susceptible to a variety of ailments and are well-versed in disease classification. After running a Text Search Query (using NVIVO.10) for the selected transcript of IDIs and FGDs, the data in the table was extracted.

Therefore, to cope with the diseases or illnesses mentioned above, STCs are using their own healthcare system developed using locally available materials and applying indigenous wisdom, beliefs, and worldviews. Their healing techniques include (a) knowledge of plants and secondary compounds, animals and by-products, water, soil, and other minerals, (b) special skills such as massage, and (c) treating with mantras and magico-medicinal practices. During the investigation, it was also observed that STCs' therapeutic methods are not restricted to their own medicinal practice but also include assistance from other professionals (allopathic medicine or Ayurveda) and folk medical traditions. In the following sections, the healing methods of STCs are examined in greater depth, but first, a few questions must be addressed. What is the structure of the

[37] Informant No IDI-K-04-20\0202 has responded during the IDI among the Kattunaickan community.
[38] Informant No IDI-C-02-20\0316 has responded during the IDI among the Cholanaickan community. .
[39] Informant No IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.

healthcare system among STCs? Is there a similar system for delivering healthcare in each STCs, or do they differ?

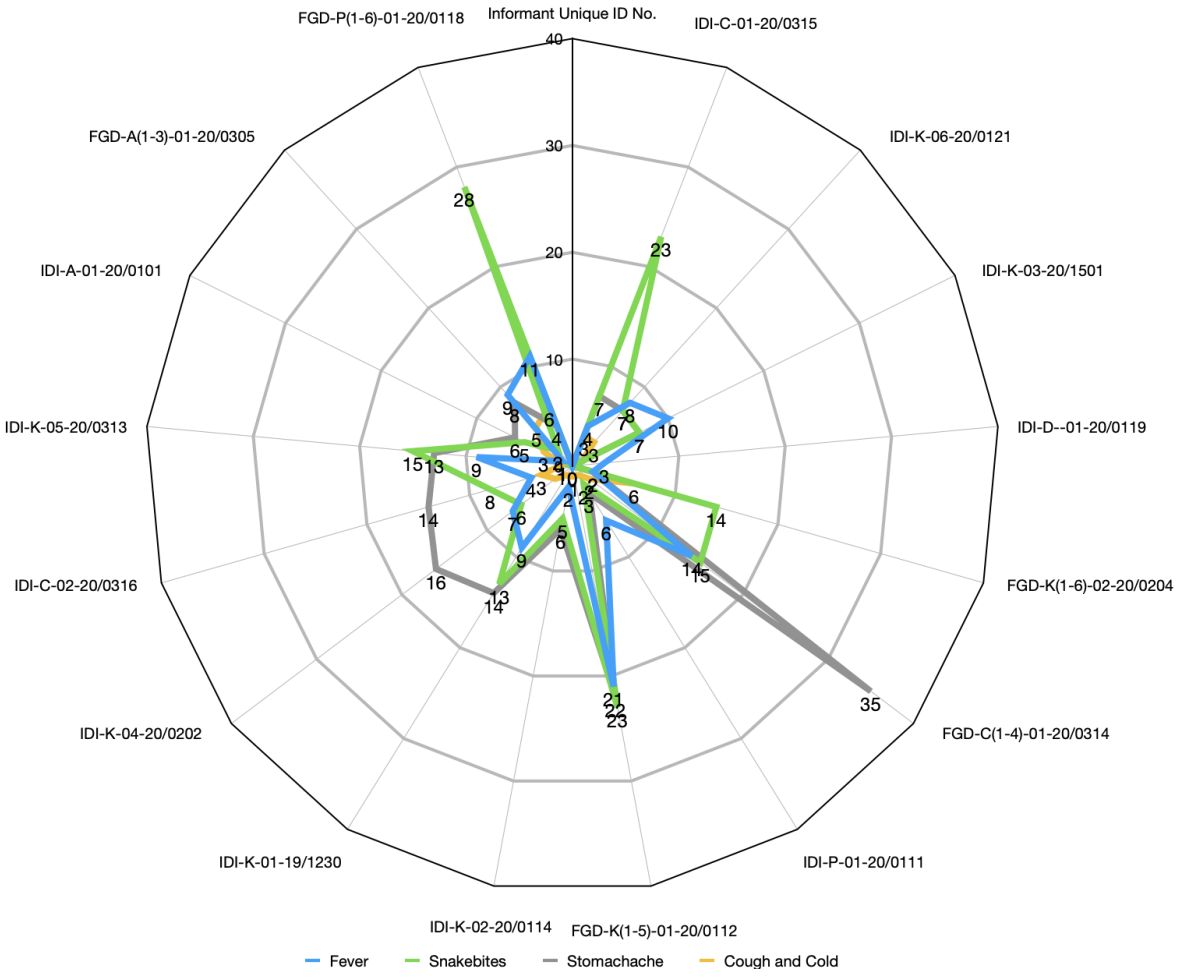

Figure 44 The graph for the name of diseases mentioned by STCs during IDIs and FGDs.

3.3 Healthcare System of STCs

The STCs have virtually comparable procedures for providing healthcare to their members. Their healing mechanism incorporates intervention from three interconnected worlds, i.e. the physical world, sacred world and human world. For example, the

healing process incorporates the physical world in the form of ethnomedicine or physical substances; the human world as caregiver or consultant; and the sacred world in the spirit, gods etc., for diagnosis and healing processes. It is also worth noting that STCs represent 'polyphasic culture'[40] and their worldviews are based on indigenous philosophy, in which the three worlds indicated above are intertwined (details are discussed in Chapter-1). It is also important to mention here that all adults are familiar with the concepts of illness and healing. When a person is afflicted with disease, an injury, or an accident, s(he) can heal on their own or with the assistance of family members or close friends. For example,

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<Internals\\Interview Transcript\\ FGD-K(3)-02-20\0204 > - § 1 reference coded [0.56% Coverage]

Reference: Self-medication

……If there is a small wound, it will cure by using it. See my injury; my younger brother did this using an iron bar. I got severe injuries, but I didn't go to the hospital; I used this medical plant and treated it[41].

<Internals\\Interview Transcript\\ IDI-K-06-20\0112 > - § 1 reference coded [0.56% Coverage]

Reference: Healing with the help of family members and close Associate

……..I jumped over the bark of " Maruth" tree (Terminalia Arjuna), and one of the barks got pierced into my skin; then brother cut it and removed himself[42].

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[40] According to anthropologist Charles Laughlin (1992), cultures are either "monophasic" or "polyphasic." Polyphasic cultures value perceptual processes that use altered states of consciousness, such as dreaming, lucid dreaming, contemplation, ecstatic and trance states, as well as ordinary waking consciousness**Invalid source specified.**.

[41] Informant No. FGD-K(3)-02-20\0204 has responded during the FGD among the Kattunaickan community.

[42] Informant No. IDI-K-06-20\0112 has responded during the IDI among the Kattunaickan community. .

STCs have acquired healing knowledge as an integral part of their culture. A particular social role of the healer is not found in any of the four STCs, and there is no professional healer or anyone with propounding knowledge (*vaidaim*) of healing. Healing knowledge exists in the form of collective knowledge, but it is distributed unevenly among community members (male and female). The majority of adult males are familiar with healing techniques. Females also have medical knowledge, but their role as healers is confined to home remedies and ailments that only affect women. However, it is important to highlight that STC members' socio-economic behaviour such as subsistence practices, labour division, and individual cognitive capability and interests can sometimes contribute to knowledge variability (i.e. who knows what and why?). For example, an individual with a keen interest in learning medicinal plants or appropriate therapy techniques, or a personal preference for work such as collecting medicinal plants for Ayurvedic vaidaim (as a subsistence practice), can acquire comparatively more healing knowledge than the rest of the community members.

Even though all adults are aware of and have access to healing knowledge, each community has a Chenmakkaran or Moopan (leader of the settlement or colony) who usually performs healing and other ceremonies among STCs. For example, Maddukkaran[43] (in Cholanaickan), Moopan (in Kattunaickan), *Marunnukaran\Daivakkaran*[44] (in Paniyan\Katuupaniyan) and Ooru Moopan (in Aranadan) perform healing rituals. While it is important to understand that the individual himself\herself can administer medication. The *Chenmakkaran* or *Moorpan* or Maddukkaran or *Marunnukaran\Daivakkaran* is not a professional healer of the community; rather, his role changes as he fulfils various responsibilities such as community representative for the government, headman, priest, oracle, and so on. However, their ability to hold more knowledge and officiate rituals lends them additional credibility.

How do STCs make healthcare more accessible to their members? What are the fundamental mechanisms of the STC healthcare support system? Before delving deep into the healing practices and their forms and procedures, the aforementioned are the few questions that must be explored. As previously stated, healing knowledge is

[43] V. Nair in his book "Tribal health and Medicine in Kerala" described *Maddukkaran* as a *Chenmakkaran* who is proficient in herbal therapy (Nair V. , Tribal Health and Medicine in Kerala. ., 2010).
[44] Ibid. According to him *Marunnukaran* is a herbalist and *Daivakkaran* is a ritual healer.

distributed as community knowledge as an inherent element of STCs' socio-cultural practices, and all adult members of the communities have a considerable amount of knowledge of acceptable therapies. Though self-medication is a popular and well-known healing approach among STCs, caregiving and ritual healing practices are also widely used. Therefore, to perform healing, the role of the social network becomes crucial. STCs' primary social network consists of family members and close associates in the neighbourhood. However, they may occasionally include a distant member of his own community or an experienced member from another community to provide necessary and appropriate health care support to the sick\ill individual. In addition, they work as a supports system to perform healing rituals and share opinions on the best possible healing option, especially in the case of severe and life-threatening diseases or illnesses. However, the participation of members of other communities in the healing process is limited. In other words, the function and obligations of individuals from outside the family are limited as specialists and consultants.

The schematic diagram below (Fig.45) shows how STC's social network works to give health care support to its members and make healthcare accessible to all its members. The diagram was developed using observational and other collected data by the research during fieldwork. It is vital to note that STC's social-cultural practices and belief systems might vary significantly from one community to the next, even though their social networks have comparable functions and social behaviour. As depicted in the schematic diagram below, an individual suffering from diseases or illnesses seeks to heal from all three worlds, namely human, physical, and sacred (as explained above and in Chapter -1). In which the human world has an increasingly vital role. It is because it includes family members (as caregivers), neighbours (as consultants), and other close or distant relatives (as specialists) in the healing process. The Schematic diagrams also show how variables in the healing process, such as collective knowledge, might affect the outcome. However, the following sections of this chapter contain a complete discussion of the healing practices of STCs. But before delving deep into the method and mode of healing practices of STCs, it is vital to address the following key questions. (a) How do STCs perceive health? (b) How do they determine the health status and nature of diseases or illnesses?

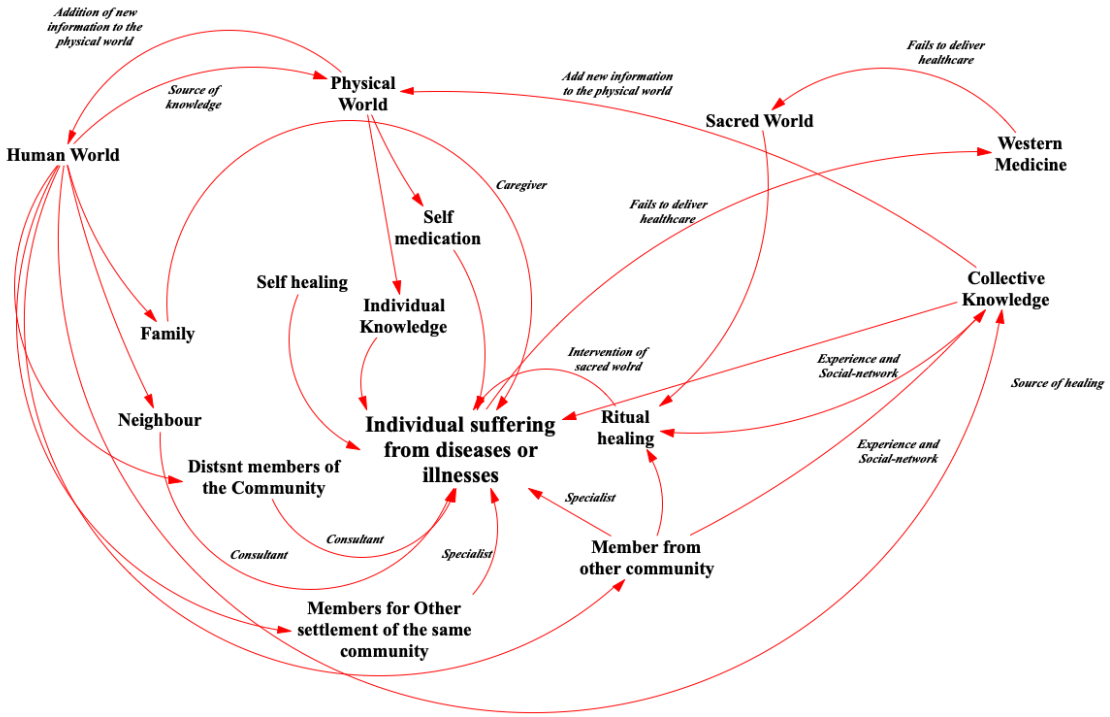

Figure 45 Schematic diagram for STCs healthcare support system (Created suing VensimPLE).

3.4 STCs' Perception of Health

It may be instructive first to analyse how STCs perceive health and what healing means to them before exploring and analysing the characteristics of various healing practices used by STCs. It is crucial since previous research conflates STCs healing procedures with holistic approaches, but little attention is paid to their septate characteristics. Therefore, in this part, the researcher has opted to discuss STCs' perception of health in detail.

3.4.1 Concept of Health among STCs

As discussed in Chapter 1, the existing literature on STCs' health associates it with the holistic approach in which the mind, spirit, and emotion must be in a state of balance and harmony to ensure a healthy body (Nordenfelt L. , 2007). Any imbalance or disruption can be regarded as a disease (Nordenfelt L. , 2007). The principle of wholeness or interconnectedness (i.e. everything with life is interconnected and influences each other) underpins this definition of health. It is also important to note that although the holistic definition of health is broad and fascinating, no one can claim

to be healthy under this definition because there will always be some form of imbalance between internal and external components. For example, our ecology (of which we humans are an important part) changes daily, resulting in some form of internal and external imbalance. Is it possible to classify this discord as a disease? Is everyone sick if this is the case? However, it is important to note that the researcher has by no means set out to devalue the above-mentioned holistic definition of health. On the contrary, though, the attempt has been made to critically engage in the discourse of health and arrive at an alternative model of health with the aid of STCs' indigenous wisdom.

It is important to note here that though STCs not only adhere to but also live by the philosophy of wholeness or interconnectedness but they perceive health in the form of three indices: (a) productivity, (b) causal contribution to the greater purpose of society, and (c) expected functioning behaviours\abilities. It is also vital to note that STCs do not directly correspond to health in these three indicators. The researcher identified these indices based on his interactions and discussions with STCs, as well as after performing content analysis of IDIs and FGDs. For example, in response to the question, 'how do you know whether a child or someone is unwell or unhealthy if s(he) does not tell you?'[45] STCs' responses were as follows:

> *"……the mother can understand the mood or condition of the child. It's a common phenomenon. Once they get the disease, they stop playing with other children, eating less, always crying, etc. ……"*[46].
>
> *"……..the older generation people have knee and back pain issues, so they are no longer able to come with us in the forest…"*[47]

Among the three identified indices, productivity denotes an individual's efficient participation in productive activities. Productivity means different things to different age groups. It is not consistent with the expected functioning abilities. A child's

[45] This was a common question asked during the IDIs and FGDs recording among STCs. The IDIs & FGDs were recorded between December 2019 and March 2020.
[46] Informant No FGD-A(1-3)-01-20\0305 has responded during the FGD among the Aaranadan community.
[47] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.

productivity, for example, is judged by his active engagement in playing, eating properly (as usual), displaying enjoyment, not weeping, and so on. On the other hand, adult (male\female) productivity is measured in terms of their active participation in daily activities such as sustenance and communal activity (as quoted above). Whereas the expected functioning behaviours\abilities are related to functioning under specified conditions. If a child or adult is differently-abled, for example, they must engage in subsistence or communal activities in a specific way that is predetermined based on their condition. This STCs' perception of health makes it a conditional property of being.

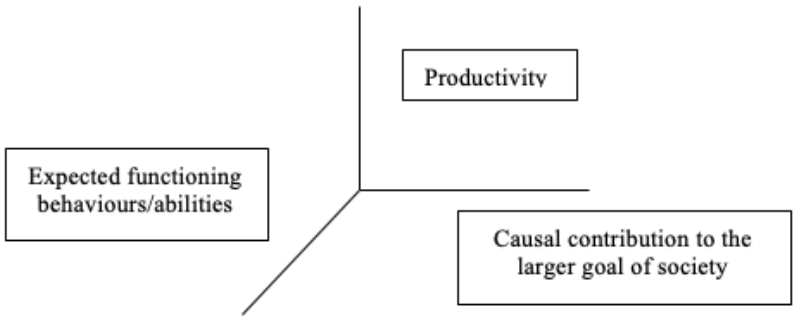

Figure 46 Indices of STCs' perception of health

But this does not mean the concept of health among STCs is restricted to only these three indicators. It has various other dimensions like self, mind, body, emotion, culture, language, and environment. For example, mental health malfunctioning among STCs can arise due to identity deficits, language loss, changes in the relationship with the land, political unrest, and accidents.

> "…….Our main god is in hilltops (maladaivam). We go there once every month or year. Our ancestors lived in those hilly areas. After the invasion of the Britishers, they forced us to leave those places and planted teaks there. Aranadans are less in count now, and living in different areas….."[48]

[48]Informant No FGD-A(1-3)-01-20\0305 has responded during the FGD among the Aaranadan community.

According to the preceding extract, displacement from the place of origin has changed the relationship with the land, negatively impacting their population. C K Janu (in an interview with India Today) stated that displacement-led development policies have resulted in socioeconomic stress, addictions-alcoholism, and mental health problems among Kerala's tribes (Binduraj, 2013). Sumant Badami (2014), in his paper titled "Suicide as a counter-narrative in Wayanad, Southern India: The invisible death." has also discussed that factors like identity deficits, changing relationships with the land, socio-economic distress etc. can affect the tribal mental health adversely and lead them to commit suicides (Badami, 2014).

However, in terms of expressing the complex situation like pregnancy, accident and injury, STCs' indicators of health are more inclusive and self-explanatory than the models discussed in chapter 1, such as the Naturalistic Model -BST (Boorse, 1997), Holistic Model-HTH (Nordenfelt L. , 2007), and Integrative Model-BST & HTH (Saad & Prochaska, 2020). For example, consider the case of pregnancy. According to the model mentioned in Chapter 1, the pregnancy period should be deemed unhealthy since, during pregnancy, women are neither normal by 'species design' nor functioning at maintainable ease during pregnancy. But despite that, hardly the period of pregnancy is considered unhealthy while in actual sense, it's quite the opposite, i.e. not getting pregnant is deemed unhealthy. According to the STCs, pregnancy is productive labour that contributes to the greater society objective of creating progeny by adhering to specific established expected functioning capacities. However, they may exclude many bio-statistical diseases or illnesses and don't categorize them under health problems, e.g. skin diseases, respiratory, gastrointestinal diseases, night blindness, etc. According to STCs, these are excluded from the categories of diseases because these do not affect the above-discussed health indicators. For example, it has been observed that nearly every member of the community suffers from skin problems of some sort (Fig. 47). In comparison to the population who lives in the periphery region and works as forest labour, the situation is more acute among populations who live in the deep forest and engage in traditional subsistence practices.

47A 47B 47C

Figure 47 Skin Diseases among the members of STCs

Most importantly, apart from the bodily experience of health and illnesses, STCs involve various dimensions of life (i.e. intellectual, physical, emotional and spiritual) and establish a transpersonal relationship with the non-human organism (like- animals, plants, spirits, ghosts, ancestors and gods) for the perception of health. Furthermore, the involvement of external agencies and the metaphysical and spiritual realms makes STCs' health perception exceedingly complex. Therefore, to comprehend STCs' concept of health, the following question must be addressed. How do STCs assess their own health status? How do they figure out what kind of sickness it is? What happens after they figure out what's causing the illnesses? How do individuals\families decide what type of treatment is needed for specific diseases or illnesses? Do they only rely on home remedies, traditional therapies, or caregivers?

3.4.2 Determination of Health Status and Nature of illness

STCs attempt to maintain their health and well-being by following a set of rules passed down from their forefathers. The underlying principle (i.e. condition of balance between the self, the other, society, and the environment) to sustain health is identical among STCs, despite the fact that distinct lifeways differ substantially. Diseases or illnesses are caused by a variety of circumstances, ranging from natural to societal to supernatural. Scholars have classified these disease components into five categories: natural causes, societal causes, spiritual causes, individual lifestyles, and cultural factors (Westerlund, 2006). Scholars, however, are divided on how to classify them. The lack of agreement could be due to the fact that many diseases fall into the overlap of the specified categories, or it could be due to the fact that the majority of diseases or

illnesses have spiritual underpinnings. This complicates the procedure of determining sickness causation. On the other hand, like any other medical system, STC's treatment procedures begin with an investigation of the fundamental question: what type of disease\illness an individual is suffering from and what causes it?

3.4.2.1 Aetiology or Illness Causation among STCs:

To conceptualize the belief of ill-health causation of STCs, Peter Murdock's theory of illness has been taken into consideration, in which he distinguishes between natural and supernatural causation of diseases\illness (Murdock G. P., 1980). According to Murdock's theory, natural causation includes '*any impairment of health of as a physiological consequence of some experience of the victim in a manner that would not seem unseasonal to modern medicinal science*' (Murdock G. P., 1980). Murdock has identified five different types of illness: infection, stress, organic deterioration, accident, and overt human aggression (Murdock, Suzanne , & Frederick, 1980). Whereas Murdock's supernatural theory of includes (1) theories of mystical causation: if an '*impairment of health as the automatic consequences of some act or experience of victim mediated by some putative impersonal causal relationship rather than by the intervention of human or supernatural being,* e.g. *fate, ominous sensation, contagion, and mystical retribution.'*; (2) theories of animistic causation: if an '*impairment of health to the behaviour of some personalized, supernatural agent- ghost, soul, spirit or god'*; (3) theories of magical causation: it '*ascribe illness to covert action of an envious, affronted, or malicious human being who employ magical means to injure his victims like sorcery and witchcraft'* (Murdock, Suzanne , & Frederick, 1980).

Murdock's ill-health theoretical model is exemplary in terms of providing a theoretical framework for indigenous aetiology, but it fails to accommodate factors like transition state as a cause of diseases or illnesses. Nevertheless, Murdock's ill-health theoretical model has been adapted as a guide to design this study.

STCs regard themselves to be healthy people in general, and illnesses\diseases are seen as a common occurrence and continuous process. Most diseases lack a detailed causative explanation; nonetheless, STCs do consider life-threatening illnesses for comprehensive discussion and evaluation. In cases of deliberate and significant disease implications, the explanation of disease causation became more elaborated and included

an assessment of recent events affecting the self or immediate group. It's worth noting that they identify diseases as common[49] or uncommon[50] based on their frequency, familiarity, and collective experiences, and they attribute the cause of these diseases or illnesses to natural or supernatural sources. To put it another way, STC's health model incorporates both naturalistic and supernaturalistic explanations for diseases and disorders. Apart from that, STCs, in a few cases, also find western medicine and alcohol as responsible factors for diseases or illnesses. They claim that the introduction of western medicine and the prevalence of alcoholism have resulted in the emergence of numerous new diseases and illnesses in the population (discussed in detail below). It is important to note that STCs' theory of ill health is not limited to ancestral aetiology but also includes new factors like western medicine, alcoholism, etc. and the diversity in socio-cultural practices, STCs have essentially similar models of the theory of diseases causation, except they deem to separate god or spirit as a reason for diseases.

1.1.1.1 **Naturalistic Explanation**

STCs use naturalistic explanations to explain diseases that are apparent, rooted in daily life, recurring, non-serious, and transient. The explanation of these diseases is direct, simple and limited to a situational description of symptoms, experience, and circumstances. STCs' naturalistic explanation holds factors like cold and heat, food, water, infection, seasonal change, accident, organic deterioration (age factor), prolonged hunger, inter or intra-community violence and change in food habits responsible for a number of diseases or illnesses. For example, fever (*Cheerappu\Pani*), headache (*Ubbukuthal\Thalakuthu\thalavedana*), fever and cough (*Pani and Kura\kemmal*), stomach ache (*Oddabaruthu\Pallavedena*), dysentery (*Oddalukachathu\Chorathooral*) etc. are frequently occurring diseases, and the causal explanation of these diseases or illnesses are associated with factors like food, water, and seasonal change (heat and cold). It is worth noting that naturalistic causal explanations are consistent across age and gender for common diseases. Figure 48 lists a few names of common illnesses that affect people of all ages and genders and are

[49] If a diseases or illnesses is minor, frequent can be explained based on concrete experience , it is considered as common diseases.

[50] If a diseases or illnesses is deliberate, prolonged and life-threatening and no proper explanation of disease is known , such disease are classified as uncommon diseases.

explained by natural causes. While, here are a few examples of extracts from IDIs and FGDs (of STCs) where the informant indicated natural factors as a cause of diseases or illnesses.

<Internals\\Interview Transcript\\IDI-K-03-20\1501> - § 1

reference coded [1.42% Coverage

Reference: Headache and Fever

*…….These are the effect only of the **cold water** we are getting here. We are drinking and bathing in this water. Which is making this problem*[51].

<Internals\\Interview Transcript\\ DI-C-02-20\0316> - § 1

reference coded [1.28% Coverage]

Reference: Stomach upset

*……. It is due to **food infection***[52].

<Internals\\Interview Transcript\\ IDI-K-01-19\1230> - § 1

reference coded [0.95% Coverage]

Reference: Children

*……..sometimes **food** might be the reason. If a baby eats food after milk, their stomach doesn't accept it. At that time, vomiting or stomach upset will happen*[53].

<Internals\\Interview Transcript\\FGD-K(1-5)-01-20\0112> - § 1

reference coded [0.90% Coverage]

Reference: Women

[51] Informant No IDI-K-03-20\1501 has responded during the IDI among the Kattunaickan community.
[52] Informant No DI-C-02-20\0316 has responded during the IDI.
[53] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

Person 5: …. We think it is due to ***food and water***[54].

STC's theory of ill health also incorporates natural hazards as a disease-causing factor in a few cases. According to STCs, diseases such as stomachache, vomiting, loose motion, fever, diarrhoea, etc. are water-borne. The prevalence of these diseases is higher during floods because the water comes into contact with many toxic plants (found in and around the area) and other contaminants. People use that contaminated water for cooking and drinking, causing them to become ill. As an example,

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<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112> - § 1 reference coded [0.67% Coverage]

Person 5: …..yes, we have suffered from stomach pain, diarrhoea, fever, vomiting, and cough[55].

<Internals\\Interview Transcript\\ IDI-K-05-20\0313> - § 1 reference coded [0.85% Coverage]

……We had Vomiting and loose motion. There are several things, including toxic plants that are mixed with water during flooding. We didn't have wells earlier. Then we use this water for our cooking purposes. That causes diseases[56].

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[54] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[55] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[56] Informant No IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.

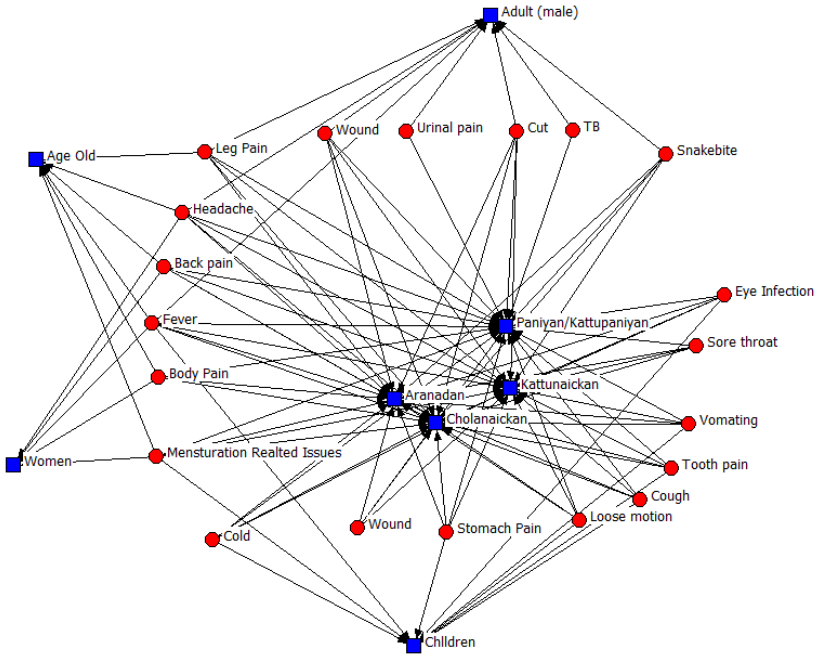

Figure 48 The nodal network of the common diseases found across found among each section of STCs. In this graph, the red dot indicates the name of disease\illness, the blue square denotes the section of society (adult, old, child, women) and the name of the community

1.1.1.2 **Supernaturalistic Explanation**

The supernaturalistic explanation is applied to persistent, deliberate, serious diseases in their implications and also if sick people fail to respond to self-medication and home remedies. Unlike a naturalistic explanation, it is more elaborate and involves a review of recent happenings of self and immediate group. It finds external divine or unworldly agents like spirit (evil), ancestors, gods etc. or a person or enemies outside of their immediate group responsible for causing diseases. Each community of STCs associate a separate spirit as a causing factor for separate diseases. They mainly include three factors under supernaturalistic explanation, which are as follows: (a) deity or gods anger, (b) ancestral or evil spirit, and (c) black magic. Here are a few extractions (as examples) from the IDIs and FGDs, in which the informant has mentioned supernatural agents or black magic as reasons for diseases or illnesses.

<Internals\\Interview Transcript\\ <IDI-K-01-19\1230> - § 1 reference coded [1.26% Coverage]

..... "Mayam mariyal" or " pottithiriyal" is an act of the devil. When a person can't find the way, she or he is trying to find her or his way back home, but s(he)can't and will roam all day or night to find their home. This is known as " Mayam mariyal"[57].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112> - § 1 reference coded [2.29% Coverage]

Person 5: Yes. We can find those who did black magic to us. The diseases will come due to the witchcraft done by our enemies[58].

Person 3: Someone will do black magic to kill us, or they will try to vanish us from here; they offer some money (panam), Pattu(silk), Kalikaran (coconut). We pray to our Mala Dhaivam (god) and take the money and dip it into a steel utensil filled with water, then pray to our god and grandmother(Muthashi).....and it will return back to them(who did witchcraft)[59].

<Internals\\Interview Transcript\\ IDI-K-06-20\0121> - § 1 reference coded [1.60% Coverage]

.... Maybe the reason is the anger of God[60].

<Internals\\Interview Transcript\\ IDI-P-01-20\0111> - § 2 references coded [5.16% Coverage]

..... People have less belief in god nowadays. Our ancestors had a clear mind in worshipping gods. They had maintained all activities related to gods. These days we can see carelessness. So it causes this kind of issue in the hill and society. I think all issues are created by humans[61].

[57] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[58] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[59] Informant No FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[60] Informant No IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[61] Informant No IDI-P-01-20\0111 has responded during the IDI among the Paniyan community.

<Internals\\Interview Transcript\\ IDI-K-01-19\1230> - § 1 reference coded [1.49% Coverage]

*…… when we go to the forest or riverside, sometimes we get scared and get a fever. It is locally called "**malavilly**". We will go to the hospital, and if it doesn't cure, then we will do some rituals. Almost people in Nilambur have the same kind of rituals, but differences in language or stages of ritual practices*[62].

As mentioned earlier, each community of STCs believes in separate gods and spirits; therefore, their supernatural causation of diseases or illnesses is also associated with separate supernatural agents. For example,

- **Paniyan\Kattupaniyan**: Paniyan believes that Kuttichathan (a mischievous Imp) and Kuliyan (a demon) can cause diseases\illness. Kuttichathan can cause vomiting, dysentery, diarrhoea etc., and Kuliyan can cause fever with severe body pain, shivering, and headache (which may lead to sudden death). However, they also worship the female deity Thampuratty or Kooli and believe that the deity protects them from diseases or illnesses. Whereas an act of disrespect to Thampuratty or Kooli can cause fever or headache. Apart from that, they also hold their enemy responsible for causing diseases\illness through witchcraft or using demon hirelings, e.g. Kuttichathan and Kuliyan. The individual who has a command over these demon hirelings is called Vaishyakkaran; community members are sacred to him\her. Vaishyakkaran performs Vaishyam, which can cause oedema all over the body, severe fever etc. (Nair V. , Tribal Health and Medicine in Kerala. ., 2010). For example, according to Nair (2010), there are multiple methods of Vaishyam; in the first method, the Vaishyakkaran use a person (intended to harm) body waste (e.g. nail, excrement, urine) or clipping of used cloth or other object used that individual and mix it with slat. After mixing, the Vaishyakkaran fill the mixture into a coconut (after removing water), and once it's ready, Vaishyakkaran holds the coconut in his\her hand and goes into the deep water and leaves the coconut in the water. This act of Vaishyam can cause oedema all over the victims' bodies, which eventually can lead to death sometimes. Whereas in the second method, the

[62] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

Vaishyakkaran alike, the first method primarily collects the body waste of the intended victim and puts it into a pit, thereafter killing an *onthu* (calote) and burry it into the pit where the collected body waste victim is kept (Nair V. , Tribal Health and Medicine in Kerala. ., 2010). The Vaishyakkaran believes that the victim's body will decay likewise the dead calote in the pit. The second method of Vaishyam can be categorised under the 'sympathetic' magic category, which is based on two principles two: "*first, that like produces like, or that an effect resembles its cause; and, second, that things which have once been in contact with each other continue to act on each other at a distance after the physical contact has been severed*" (Frazer, 1990).

- **Kattunaickan**: Similar to Paniyan, Kattuanaikan also believes that prolonged and serious diseases are caused by supernatural or external agents like demons, evil spirits, witchcraft or Blackmagic. They believe that due to anger of God or spirits, e.g. Maladaivam (hill god), Nammilichi (clan ancestral god), Nammaliedathi, Kammili, Gulikan, Cheriyavattivadi, Valiyavattivadi, Payachan, Karikundachan, Kuliyan and Kuttichathan people get diseases\illness. For example, the goddess Nammaliedathi is considered the goddess of smallpox. However, they also deem spirits like Villiyan as a reason for diseases like fever, for example, Malavilly (as described above by informant no. IDI-K-01-19\1230) and Anjittu (disease due to fear).

  Kattunaickan also experiences "Mayam mariyal" or "Pottithiriyal". It is an experience in which a person gets dizziness and is unable to find the way back to home or abode. They believe it is an act of the devil (as described above by informant no. IDI-K-01-19\1230). Black magic is also considered as one of the major reasons for diseases among Kattuanickan, In the above-cited extraction from the focused Group discussion (FGD-K(1-5)-01-20\0112), the community members have mentioned the act of Blackmagic as a reason for diseases, and they also motioned their strategies to tackle or reverse the Blackmagic.

- **Cholanaickan**: Cholanaickan believes that the demon Villiyan can cause Kurkke. They also believe that the wrath of God-like Odakolli Daivam (god of heath and remover of illness), Manjaranadu Daivam (god of heath and remover of smallpox)

and Maladiavam can also cause diseases. However, diseases like fever, headache, leprosy, vomiting etc., are consequences of the wrath of ancestors. Comparatively, Cholanaickan's causal explanations are similar to diseases or illnesses are similar to Katunaickan.

- **Aranadan**: Aranadan believes that the wrath of supernatural agents like dead ancestors' spirits, deities etc., are the reasons for diseases or illnesses in the colony people. However, there are fewer references to the name of a supernatural agent or witchcraft practice in their explanations of ailments. They frequently visit the hospital when they contract diseases or become ill. It could be due to the reason that Aranadan's population is currently settled in colonies on the outskirts of the forest and has regular interaction with the non-tribal communities of Nilambur, as well as proper access to the allopathic doctor due to the geographical placement of their colonies near villages or cities. This is not to say that Aranadan does not have its unique flavour. It does not mean that Aranadan does not have its own healing system. Alike other STCs, they also have their medicine and rituals for curing illnesses.

STCs hold alcohol and other destructive addictions, western medicine, pollutants, and the arrival of an outsider and their harmful activities accountable for diseases or illnesses, in addition to the natural and supernatural reasons mentioned above.

- ***Alcoholism and Other Harmful Addiction:*** According to STCs, alcohol is one of the leading causes of diseases such as cancer, heart disease, ulcers, and diabetes, as well as mental health issues, public fights, and interpersonal and intracommunity violence, all of which have resulted in increased mortality and morbidity among community members. Male family members of STCs frequently begin drinking at a young age, either through peer groups or parental channels. STCs reasoned that alcohol is causing male members to die at a young age. In the next chapter, we'll look at why and how alcoholism becomes such a serious problem among STCs. Here are a few extracts (as instances) from IDIs and FGDs where the informant mentioned supernatural agents as a cause of diseases or illnesses.

<Internals\\Interview Transcript\\IDI-K-01-19\1230 > - § 1 reference coded [0.71% Coverage]

Third-person: 20 years ago, the life expectancy was very high, around 80- 100. Now it is decreasing to 45 – 60 because of the alcohol[63].

<Internals\\Interview Transcript\\IDI-K-01-19\1230> - § 1 reference coded [1.58% Coverage]

Yes. More people are using liquor.
But it leads to violence. They will make fight after the consumption of alcohol[64].

<Internals\\Interview Transcript\\FGD-A(1-3)-01-20\0305> - § 1 reference coded [1.57% Coverage]

Person 2 ...Only 5 men are above 35 in here. ....They die at a young age. Alcohol consumption is a factor[65].

<Internals\\Interview Transcript\\IDI-K-01-19\1230> - § 1 reference coded [1.17% Coverage]

Third-person: Most people spend their money buying alcohol. So they don't take care of their health and don't eat proper food. It affects their mental health conditions[66].

[63] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[64] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[65] Informant No FGD-A (1-3)-01-20\0305 has responded during the FGD among the Aranadan community.
[66] Informant No IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

- ***Western Medicine:*** The relationship of western medicine with STCs is complicated and inexplicable. On the one hand, STCs parallelly use western medicine as a therapeutic measure, whereas on the other hand, they believe that western medicine is one of the prime reasons for the increasing number of diseases in the community. In the subsequent section of this chapter, the researcher has deliberated the intricate relation of western medicine with STCs and their healing practices in detail. First, however, here are a few extractions (as examples) from the IDIs and FGDs, in which the informant has denunciated western medicine for diseases or illnesses.

<Internals\\Interview Transcript\\IDI-C-01-20\0315> - § 1
reference coded [0.45% Coverage]

In those days, diseases are less in our community. However, after Allopathy came into existence, the number of diseases increased[67].

- ***Contagion and Pollutants:*** STCs believe that coming in contact with a polluting object, substance, or person is one of the reasons people fall ill. Among all, coming in contact with an outsider (non-tribal community or members from the other community) is considered a major source of diseases. According to STCs, in earlier days, diseases among the STCs had fewer because they had less contact with outsider people, but now diseases have increased because of frequent interactions with outsider people and also due to infiltration or incursion of the outsider into their traditional habitat. For example,

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<Internals\\Interview Transcript\\ IDI-K-06-20\0121> - § 1
reference coded [3.11% Coverage]

…. They have mantras. In those days, there was a belief in untouchability among us. ….They can identify if (diseases) are due

[67] Informant No IDI-C-01-20\0315 has responded during the IDI among the Cholanaickan community.

to the touch of an untouchable thing or not. And if a person goes outside, he should take a bath when he comes back home. ….There were comparatively fewer diseases because we didn't go outside and touch others[68].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112> - § 1 reference coded [1.08% Coverage]

Person 5: The outsiders come to the forest and do something harmful to the hills, which affects us[69].

Holding outsider responsible for the diseases\illness is a pervasive theme among the STCs. They are united in their belief that outsiders are the reason for disease and illness. In this way, diseases are frequently linked to the other, whether it is another caste or ethnic group. This categorization establishes psychological and social barriers. Drawing the lines between the community members and outsider allows people to distinguish between healthy and sick and re-establish control over perceived threats, protect existing social institutions, and eliminate the risk of coming into touch with disease sources (Nelkin & Gilman, 1988).

3.4.3 Methods of Diagnosis of STCs

STCs deduce the root cause of illness\diseases through a systematic quest for answers to the following questions: What illness is the person suffering from? Who and what has caused it? Why has it affected a particular person at a particular time? Likewise, STCs' aetiology their diagnosing technique also have those three worlds. Before delving into the specifics of the diagnosing approaches, it is critical to understand the fundamental idea of STCs' diagnosis.

After the thematic analysis of IDI and FGD transcripts, the researcher observed a fundemental underpinning concept in the context of STC diagnosis, i.e. STCs seek to establish a one-to-one relationship between the pre-existing disease causation

[68] Informant No \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[69] Informant No \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.

component and the external manifestation of that causation factor on the body throughout the diagnosis process. Consider the following scenario, as example:

"A" is a pre-existing illness causation factor

"ß, ¥, Δ and Ω" are methods of diagnosis

"1" is a disease (i.e. the external manifestation of causation factor on the body)

In the diagnostic process, STCs use methods of diagnosis such as "ß, ¥, Δ and Ω" to establish one to one relationship between "A" and "1 (as shown in Fig 49A). It is a simplistic model if there is one disease and one causation factor however when there are many diseases and multiple causation factors, determining the relationship between the causation factor and diseases becomes a complex process (as shown in Fig.49B).

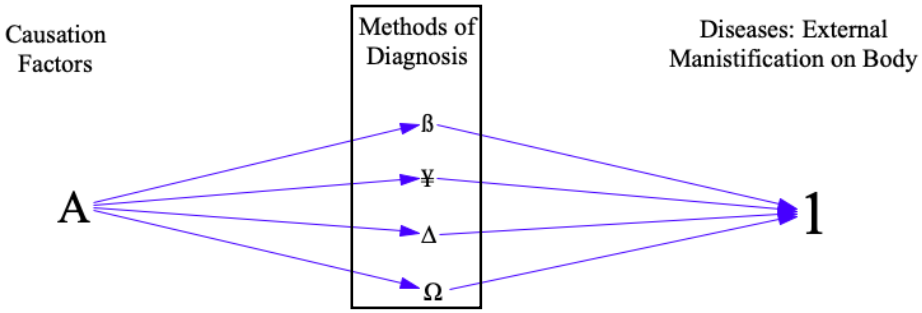

Fig. 49A

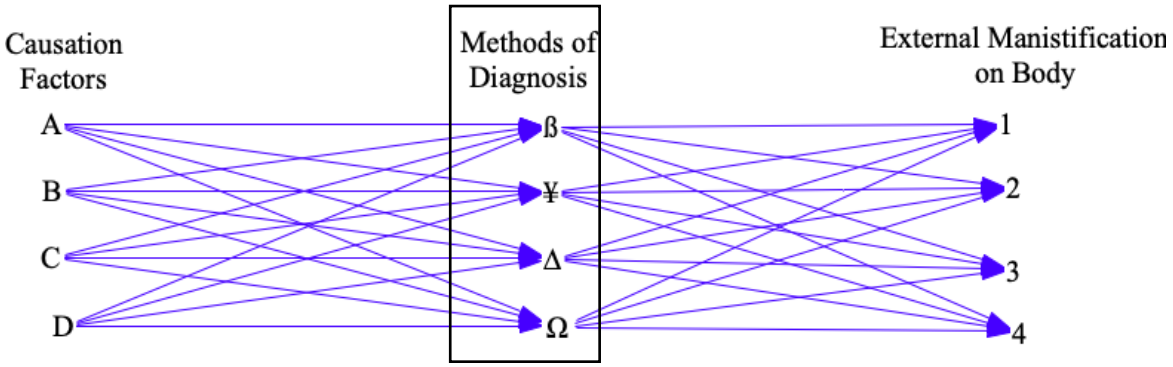

Fig. 49B

Figure 49 The underlying concept of diagnosis among STCs. The 7A explains the situation when there is one disease and one causation factor. Where 7B explains the situation when there are multiple diseases and multiple causation factors. The graph was created using VensimPLE.

The study identified and analysed two basic types of diagnostic processes used by STCs: (a) physical\natural means diagnosis and (b) non-physical\supernatural means diagnosis. It is important to note that, despite the fact that each community of STCs are independent tribal groups with varied cultural and ritual practices and distributed in different geographical locations, their essential diagnostic concepts are the same. This does not, however, imply that their diagnostic processes are uniform across STCs. Fig. 50 encapsulate the primary method of the diagnostic process of STCs.

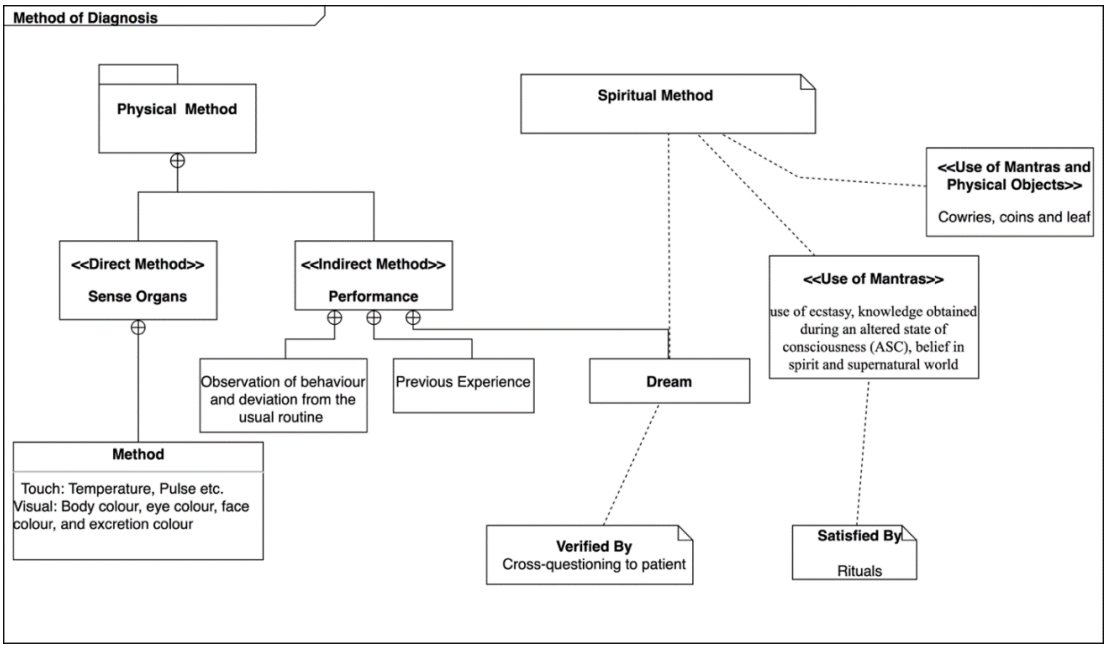

Figure 50 Methods of Diagnosis among STCs

3.4.3.1 Diagnosis Through Physical Means

The physical method of diagnosis incorporates an indirect and direct method of diagnosis. The direct method includes sense organs in the diagnostic process. For example, touch (body temperature variations, pulse etc.), visual perception (to observe body colour, eye colour, face colour, and excretion colour), smell, etc. The indirect method, on the other hand, entails close monitoring of behaviour (both long and short

term) as well as patient reaction to disease\illness. The indirect approach is an experience-based method in which diagnosing processes involve both individual and community experience. Dreams are also included in the indirect method's diagnostic process. It is important to note that dream is used in both the physical-indirect method and the non-physical\supernatural method of diagnosis. For the indirect method, the dream is used as a primary means of diagnosis, which is later verified by the cross-questioning of the patient (regarding the symptoms) and applying a direct method to confirm the diagnosis reviled in a dream state. Here are a few extractions (as examples) from the IDIs and FGDs, in which the informant has mentioned some of the direct methods of diagnosis.

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112> - § 1 reference coded [1.66% Coverage]

Reference: Touch and Observation

Person 3: 1…..We check if there is any pain in the body. We can understand through observation. We will touch and inspect the patient[70].

Person 1…..we will open the Mouth and check it. The pain will only come if there are cavities in the tooth[71].

<Internals\\Interview Transcript\\ IDI-K-03-20\1501> - § 1 reference coded [1.79% Coverage]

Reference: Touch

[70] Informant No \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[71] Informant No \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.

....when someone got stomach pain and all, I touch the stomach at the intestine area, and if there is any problem, we can understand that. Then I will give them the medicines for that[72].

<Internals\\Interview Transcript\\ IDI-K-05-20\0313 > - § 1 reference coded [1.16% Coverage]

Reference: Touch

... If children get vomiting, we check their stomachs and then find their problems. If a child feels stomach upset and any issues in the intestine, we can treat them[73]

<Internals\\ Interview Transcript \\ IDI-C-01-20\0315> - § 1 reference coded [1.64% Coverage]

Reference: Touch

……..I check blood circulation, Pulse and fever[74].

3.4.3.2 Diagnosis Through Non-physical\Supernatural Means

The non-physical\supernatural means of diagnosis involve the use of mantras, rituals, ecstasy, dream, knowledge obtained from an altered state of consciousness (ASC), spirit, ancestors, gods and the supernatural world. In this process, the healer consults the 'sacred world' to find out the root cause of diseases and discern whether the patient was involved in any act of infringement and disruption of the established order. The non-physical\supernatural means of the diagnostic process are involved in the following circumstances:

i. Diseases are prolonged, and sick people fail to respond to self-medication and home remedies

[72] Informant No \\ IDI-K-03-20\1501 has responded during the IDI among the Kattunaickan community.
[73] Informant No \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[74] Informant No \\ IDI-C-01-20\0315 has responded during the IDI among the Cholanaickan community.

ii. If a sick person fails to respond to treatment provided by western medication
iii. If illness is more deliberate and severe in its implications
iv. The disease that has spiritual underpinning can only be diagnosed, treated or reversed by sacred means.

It is important to note here that the non-physical\supernatural means of diagnosis not only use nonphysical means, but they also draw on physical objects like charcoal, cowries, leaves, etc. Therefore, before delving deep into the non-physical\supernatural means of diagnosis, it is important to describe frequently employed diagnostic processes briefly. The processes are as follows:

- **Diagnosing through Dreams**: According to STCs, dreams are one of the essential and vibrant methods to determine the cause of disease. In the dream state, a god or ancestor or spirit discloses everything about the cause of diseases or illnesses to the healer. The dream not only uncovers the type of problem or the cause of the problem but also reveals how the problem can be solved.

- **Diagnosing through Trance**: Extending into a trance state to find out the cause of disease\illness is the most frequently used non-physical\supernatural means of diagnosis. From the trance, the healer divulges the cause of disease\illness to the patient. The patient has to remember what the healer communicated because after returning from the trace, the healer will not remember what s(he) has told in a trance state. According to the healer, in trance or possession, s(he) links himself\herself up to the spirit of the ill person with a divine being to find out the reason for the problem. In due course, the divine spirit will narrate the root cause of illness through the healer. In this method of diagnosis, the healer works as an intermediator and interpreter between the divine spirit\supernatural power and the sick or ill person.

- **Diagnosing through Cowries**: STCs consider casting cowries an effective medium of diagnosing diseases. The healer\practitioner invokes special incantations so as to greet and invite spirit or god at the helm. The cowries we generally caste inside the prepared table on the ground or in the basket

(*daivakottai*). Based on the pattern of the cowries, they interpret the meaning and reveal the cause of diseases or conditions of health. However, the practitioner also believes that not everyone can cast cowries and that those who do must have special power conferred upon them by their master in order for cowries to communicate with them.

- **Diagnosing through Mantras, Fire and Charcoal**: This is an elaborate method of diagnosis. It is performed mainly by the *Chenmakkaran* or *Moorpan* of the community. For example, the Maddukkaran (in Cholanaickan), Moopan (in Kattunaickan), *Marunnukaran\Daivakkaran* (in Paniyan\Katuupaniyan) and Ooru Moopan (in Aranadan) employ this diagnostic process. Though, in a few cases, a capable older member from the same or different community can exercise it. In this process, an elaborate ritual is performed along with songs and dancing to appease the god. This is more of a public affair, and purification of the family members and close associate are required. Then, in due process, the practitioner or *chenmakkaran* or *moorpan* will chant mantras and blow the patient with charcoal to find out the root cause of the illness. For example, *daivamthullal* (in paniyan)

Here are a few extractions (as examples) from the IDIs and FGDs, in which the informant has mentioned some of the non-physical\supernatural means of diagnosis.

<Internals\\Interview Transcript\\ IDI-K-01-19\1230> - § 1
reference coded [1.94% Coverage]

Reference: Dream

.....during sleeping, *the **dreams** show the true or likely reason for the diseases and sometimes it is due to the anger of mala dhivam (hill god) or our ancestors. Then we will treat them with mantras*[75].

[75] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

<Internals\\Interview Transcript\\ IDI-C-01-20\0315> - § 1
reference coded [1.11% Coverage]

Reference: Charcoal

....we believe in God other than medicines. Mooppan used to blow them by chanting mantras with the blessing of our grandparents. We do a custom for analysing disease. We sing a song in praise of God after that, blow them using ***charcoal***[76].

<Internals\\Interview Transcript\\ IDI-K-01-19\1230> - § 1
reference coded [1.01% Coverage]

Reference: Cowries

……we are also treating pregnant women and the person who has a bone fracture. We are using ***cowries****(connected to astrology) to understand whether pregnant women's health is good or not*[77]

Despite the fact that the core principle and means of non-physical\supernatural diagnostic procedures are indistinguishable, each community of STCs has its own ceremonial diagnostic process due to cultural differences and religious beliefs. 'Divination' is a term used to describe non-physical\supernatural methods of diagnosis. Each community of STCs believes in their own divination practices. In general, divination is practiced to foretell the future or the unknown by occult means (Tseng, 2012). In this act, mostly the diviner interprets the instructions to the client, but in a few cases, an additional interpreter is required to explain the symbols, gestures and instructions of the diviner to the client. Therefore, the relationship between the diviner, interpreter and the client becomes critical (Tseng, 2012). However, in the case of divination for diagnosis among STCs, the diviner suspects supernatural power as the

[76] Informant No \\ IDI-C-01-20\0315 has responded during the IDI among the Cholanaickan community.
[77] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

cause of diseases\illness and devotes divination ritual to ascertain the reasons. It begins with a series of inquiries and a review of the patient's history. It is important to note that divination and healing rituals might overlap in some circumstances. In due process of divination, the diviner strives to answer the following questions: Why has supernatural power caused illness? Did the patient breach any norms or disrespect the divine power by any means? Is disease caused by the result of black magic or occult practices? And Who has done the back magic to the patient?

3.4.3.2.1 Divination among Cholaniackan

- ***Pattuvaipu***: Chaolanaickan performs the *Pattuvaipu* divination process to unveil the reasons for illness. *Pattuvaipu* alludes to 'recitation of spell' (Nair V. , Tribal Health and Medicine in Kerala. ., 2010). The *Chenmakkaran* or *Moorpan* of the community or settlement performs this ritual by wearing special attire (red cloth and bell anklet). He enters into the trance or possession state (*daivamkandethathu*) and divulges the cause of his illness. *Pattuvaipu* divination includes singing a song (kottukah daivvapadathu), an incantation of a spell and juggling *beeda* (a musical instrument). It can be carried out both day and night.

3.4.3.2.2 Divination among Kattupaniyan\Paniyan

- ***Daivamthullal***: In the *Daivamthullal* divination process, the *Daivakkaran* utter the cause of diseases after entering into the trance state. To enter into trance or possession, he performs a dancing ritual by wearing a red cloth, bell anklet, headgear, and holding a sword in one hand. The music of the drum accompanies the dance ritual. After reaching into a trance, he divulges the reason for his illness\disease. It is important to note here that in *daivamthullal*, the divination and healing rituals overlap. It is because *Daivakkaran,* in this ritual, not only asserts the reason for illness or diseases but also provides remedies when he is in a trance state. The *Daivakkaran* makes a special rectangular square drawing (called *kalam*) divided into sixteen to eighteen parts using rice power, charcoaled husk rice, and turmeric powder to perform this ritual.

- ***Chatramvekkal***: Though this is a non-physical means of diagnosis, it is performed mainly using physical objects like raw rice and castor seeds. However, the invocation of patron ditties is involved. In this divination process, a sick individual approaches *Daivakkaran* to know the reasons for the diseases and healing remedies, and the *Daivakkaran*, after invoking the patron god, performs divination. He takes rice seeds in his hand, suspects the reason for diseases and starts grouping them; if at the end an odd number of grains remains, only then the suspected reason is true, and otherwise, it is rejected.

3.4.3.2.3 Divination among Aranadan

- ***Nalivekkal***: This is both the diagnosis and healing ritual. In the *Nalivekkal* divination process, the *Ooru Moopan* (sometimes called *chemmakkaran*) consult their *muthappan* (ancestors) to find out the reason for illnesses\diseases. It is mostly conducted at night, and a patient's presence is not essential. In this performance, a person invokes their ancestors and Goddess *Thamburatti* by putting *Kudamani* (bronze bell) in a *Kunthamuram*, (winnowing basket), jingling it and chanting invocations. Both males and females participate in this ritual. However, most men perform this ritual, but some women do know the *Nalivekkal* ritual.

3.4.3.2.4 Divination among Kattuanickan

- ***Adikkadi***: The Kattuanaickan of Nilambur valley perform *Adikkadi* to find out the reason for diseases or illnesses. The *Chenmakkaran* invokes the god (maladaivam) and caste cowries to find out the reason for diseases. However, they sometimes also perform *tirpu* (oracle) to uncover the reason for the diseases or illness.

According to STCs, in the non-physical or supernatural means diagnosis, in order to prevent the misuse of mystical power, the maturity of the healer is crucial. The non-physical or supernatural means of diagnosis is also important because in this process,

along with the cause of the disease, the possible remedies are shown by the spirits. The purpose of the consultation is to seek permission from the ancestors, spirits, and gods to treat because they are considered both the cause and cure of the diseases. For example, diseases like smallpox and cholera are regarded as manifestations of the wrath of the ancestral spirit or gods and goddesses, and s(he) only provides protection from these diseases.

3.4.4 Steps of Diagnosis among STCs

STCs have fundamentally similar steps for the diagnosis. The first steps of the diagnostic process include self-assessment (by an ill individual). If s(he) fails to find out the reason for illness or disease, the next step employs assessment by family members. It follows by a neighbour or close associate based on their visual and concrete experiences of the members involved in diagnosing a patient. These steps mainly include physical methods of diagnosis (discussed above). For example, when family members and close associates gather together (face-to-face interaction) for the diagnosis of a patient, they mainly observe the behaviour of the patient and their reaction to illness, share practical experience and information about illness and remedies, and indulge in the conversation like the what is the cause of disease\illness, what kinds of therapeutic measure should be taken and what could be the next step if their diagnosis and remedies fail.

Whereas, if a disease is prolonged, deliberate, and a sick individual does not respond to self-medication or home remedies, or there is a suspicion of involvement of a supernatural agent as the reason for illness\disease, in that case, they consult an expert from his own community (in few cases from other communities too) for the diagnosis and healing. These steps include both physical and non-physical\supernal diagnostic processes (as discussed above). It is important to note here that in a few cases, they go for western medicine for diagnosis (as a parallel step) to find out the reason for the disease\illness. However, consulting allopathic doctors is limited and depends on the access of induvial to allopathic doctors and their belief in western medicine. The interactions of the individual with western medicine are also limited by the belief that western medicine is the reason for many diseases. The intricate relationship between

western medicine and community members has been discussed separately in the forthcoming section. Fig. 51 encapsulates the steps included in the diagnostic process by STCs for diseases, injuries, or accidents.

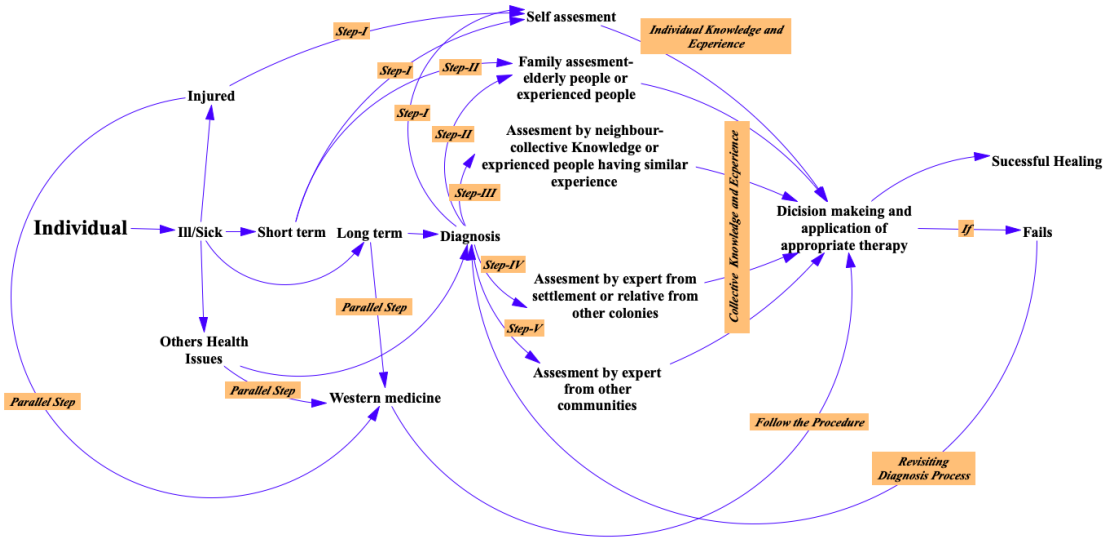

Figure 51 Steps of Diagnosis among STCs

3.5 STCs and Healing Practices

The healing and treatment process among STCs begins with determining the type of illness\disease a person is suffering from and what causes it. To put it another way, STCs begin their healing journey with a diagnosis. This is what defines the type of healing that is required. As previously discussed, all adults (male and female) have knowledge of disease\illness and healing; thus, in the normal course of events, they do their utmost to avoid disease\illnesses by adhering to traditional practices and beliefs such as performing rituals to appease their ancestors or god or adhering to traditional subsistence practices and social behaviour etc. Before going into the details of the healing practices of STCs, there are a few important questions which are needed to be explored. What do STCs mean by healing? How do STCs provide healthcare in the absence of separate institutions or professionals?

3.5.1 STCs Perception of Healing

Different medical disciplines have interpreted and characterised healing in different ways. Biomedicine, for example, defines healing as amending, removing, or modifying process (Curtis & Gaylord, 2004); Ayurveda defines healing as restoring balance and connectivity among Doshas (Pitta, Kapha, Vata) (Curtis & Gaylord, 2004); and Traditional Chinese Medicine describes healing as restoring the correct balance of yin and yang (Curtis & Gaylord, 2004). Arthur Kleinman (1978), in his famous article titled "*Concepts and a Model for the Comparison of Medical Systems as Cultural Systems*", has highlighted the problem of ambiguity in the definition of healing (Kleinman, Concepts and a model for the comparison of medical systems as cultural systems, 1978). Therefore, the exploration of STCs' perception of healing becomes important.

To understand STCs' perception of healing is important to analyse the following quote from an informant recorded during the in-depth interview.

> *"……..Most people believe in the doctor's treatment nowadays. If a person believes in God, he gets relief. If a person is a great devotee of God, he gets relief from disease. We do the same thing through mantras, exploit their beliefs, and give medicines.* ***If a person feels peace and happiness, which helps to cure half of the diseases****.* ***A psychologist brings the patient's mind back first. Then treat them****."*[78]

The preceding quotation implies that STCs perceive healing in a manner similar to Kok's (2016) concept of healing, i.e. "restoring the person to the living context" (Kok, 2016). The primary distinction between STCs' and other disciplines' perceptions of healing (described in chapter 1) is that STCs address healing in an existential framework, whilst others view it as a repairing or improvement process. Apart from the conceptual difference in healing, STCs' approach to healing is structurally separate from the disciplines such as Bio-medicine, Ayurveda, etc. There is separate functional medical institution and personnel for examining health and performing healing in each

[78] Informant No. IDI-C-01-20\0315 response from Kattunaickan community during IDI.

of the fields listed above. Healing, on the other hand, is a public affair in STCs, and no distinct functional medical institution or professional exists.

3.6 **Process of Healing among STCs**

STCs, like aetiology and diagnosis, incorporate natural and supernatural components into the therapeutic process. Plants, animals, minerals, and specialised skills such as massage are examples of natural components. In contrast, the supernatural element includes the spirit world and supernatural forces like gods, spirits and ancestors, magico-medicinal practices, mantras and rituals. STCs follow more or less an anomalous principle of healing; however, because of their separate belief in the supernatural world and differences in their knowledge of the natural world; there can be observed a difference in their healing rituals, magico-medicinal practices, or use of the natural substance for healing. It is important to note that the healing practices of STCs are comprised of shared values, beliefs, worldviews, experiences, and practices. It also includes lived, experiential and enacted knowledge, and its determinants are mind, body, spirit, ecology and socio-cultural practices. As a result, the healing practices of STCs are mainly implicit, formed locally, and embedded in socio-cultural practices, institutions, relationships (social networks), and rituals. Therefore, STCs' healing rationales are logical and empirically sound to comembers.

STCs' healing practices begin with self-medication or treatment of diseases or illnesses at the stage of the early appearance of disease or meeting with disease causation factors. It includes dietary and behavioural changes, the usage of medicinal plants or animal secondary compounds, and seeking assistance from members of their immediate social group (family members or neighbours). The assistance includes sharing medicinal knowledge, sharing medicinal material, making use of special sets of skills, caregiving, etc. For example,

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<Internals\\Interview Transcript\\ IDI-K-01-19\1230> - § 1 reference coded [0.93% Coverage]

Reference: Caregiving

Researcher: what role of society or family play in healing?

They give proper care and support. In this community, all people are related to each other[79].

If, on the other hand, disease or ailment does not respond to self-treatment, a coordinated effort at healing is required, such as conducting rituals or contacting professionals. Apart from that, there are a few other situations in which a collaborative effort at healing is required, such as when the disease is serious and persists longer than usual or when it is unfamiliar and life-threatening, or when there is a suspicion of a supernatural aspect.

The involvement of the social group in a healing process makes the STCs' act of healing more public than private because the healing process involves the participation of many members of the social group (unlike other medical traditions, where health is a subject of a professional or expert) and also shares effort, experiences, knowledge, and responsibility for healing outcomes. Before delving into the specifics of common and abstract aspects of STC healing practices, it is important to explain the various types of healing practices or treatment procedures employed by STCs.

3.6.1 Healing through Supernatural Means among STCs

As discussed above, STCs involve supernatural agents and means for healing when (a) diseases or illnesses are deliberate and life-threatening in their implications; (b) self-treatment fails to heal an individual (patient), and (c) diseases or illnesses have an underpinning of supernatural agencies. In these cases, the patient or their family members seek advice from group members such as neighbours or members from other colonies, and the healing process is primarily elaborated, which includes the incorporation of magico-medicinal rituals, mantras or spells, the use of ecstasy, spirit and the supernatural world into practices. As previously stated, each STC community

[79] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

has its own set of beliefs and socio-cultural practices, and as a result, each group has its own set of healing rituals.

3.6.1.1 Healing Practices among Cholanaickan

Chaolnaickan worships nature god (maladaivam), spirit, and ancestors, as detailed in Chapter 2, and believes that the wrath of God, witchcraft practices, or violations of social prohibitions can cause disease among community members. As a result, Cholanaickan undertake supernatural healing rituals to cure illnesses. The following are Cholanaickan's remedial measures:

- **Daivaadal**: When Cholanaickan suspects or discovers (by diagnosis) that the displeasure of ditties is the cause of diseases or illnesses, they execute this ritual. In the evening, the chenmakkaran performs this ritual (trance dance) in which he recites spells (daivapattu) and jiggles beeda while moving around the sick person. Patients are made to sit or lay down outside the house (or alai) during this ritual. It is believed that by executing this ritual, God enters the body and heals the patient.
- **Kariorissadu**: This ritual is performed to cure stomach problems, vomiting, loose motions, etc. In this ritual, the *chenmakkaran* offers the patient a chunk of spelt charcoal to swallow or chew after casting magical spells and blowing air into it. In the course of the sickness, the chenmakkaran advocates repeating this twice or three times.

- **Orissadu**: When Cholanaickan suspects that ailments or illnesses are caused by the ancestral spirit's wrath, they perform this ritual. They believe that the problems caused in various body parts are related to spirits entering the associated bodily parts; for example, when the spirit enters the head, a headache occurs. The majority of the elderly members of the community are aware of this ritual, but it is mostly carried out by the chenmakkaran. The chenmakkaran removes hostile spirits in the orissadu ritual by blowing out the air with magical spells on the affected region of the body.

- **Charadorissadu**: This is a preventative as well as a curative measure for diseases or illnesses that affect children. The chenmakkaran ties a string around the child's neck in this ritual. Several knots are frequently tied on the thread while reciting spells and blowing air into each knot.

- **Thettubekku**: When members suspect that illnesses are caused by violating societal taboos or prohibitions, they undertake this practice. As a curative step, this rural is carried out by imposing a fine on the patient as well as performing divaadal rituals (if necessary). The chenmakkaran of the colony determines the fine.

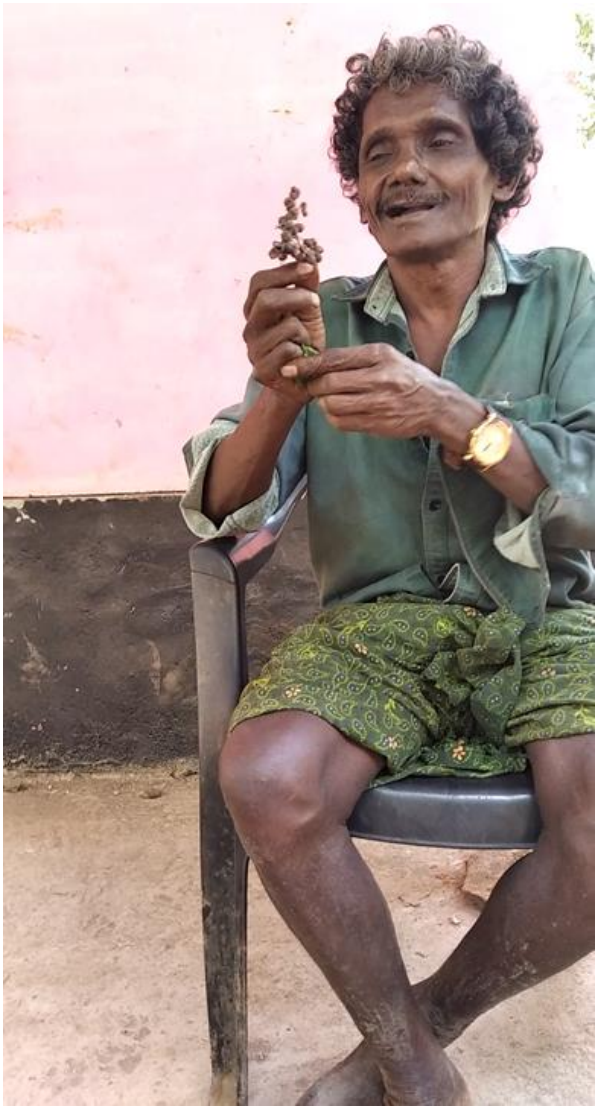

Figure 52 Traditional Medicinal Plant Usage by a Cholanaickan Healer

3.6.1.2 Healing Practices among Kattunaickkan

- **Beedapadu**: In cases of possession and psychological problems, the beedapadu is performed. The chenmakkaran performs a song to praise Maladaivam (hill god) using biruda music at this ritual. To get rid of the ailments, they also jiggle beeda and chant spells. This rite is carried out late at night.

- **Beedavekkal**: Chenmakkaran performs this ritual when the patient's disease\illness is severe, prolonged, and the patient fails to respond to self-medication. The beedavekkal ritual is performed at the chenmakkaran's place, where he sits in front of his house facing east and places tobacco, betel leaf, and lime on a plantain leaf in front of him (which are brought by the patient or their relatives). The chenmakkaran also put beeda to a plantain leaf for the ritual, in addition to the offerings. The chenmakkaran then takes the beeda in his hand and chants mantras while praying to Maladaivam (hill deity) for the patient's quick recovery. This practice is repeated every day until the patient is free of the disease\illness.

- **Koduthi**: This is the type of preventive measure taken by kattunaickan to keep themselves free of diseases and ailments. They prey to maladaivam (hill god) in this ritual and make an offering to God and their grandparents to keep them safe and healthy.

Figure 53 Healing ritual practice of Kattunaickkan community

Figure 54 Healing experience shared by individual from Kattunaickkan community

3.6.1.3 Healing Practices among Aranadan

- **Nalivekkal**: When sicknesses or illnesses are caused by the anger of a deity or ghost, the nalivekkal is performed. It can be performed by Ooru Moopan or the colony's oldest individual. The ceremony is performed at night, and the presence of the patient is not required. As previously said, this is a common ritual for diagnosis and healing. Ooru Moopan performs this ritual by placing a few kudamani in kunthamuram and chanting mantras to invite Goddess Thamburattti. After a while, the performer is possessed by the goddess, who explains the cause of the disease and how to treat it. Once the patient has recovered from the disease, she or he must make an annual gift (andunercha) of rice, betel leaf, tobacco, lime, and other similar items to the goddess Thamburattti.

- **Kali**: If a family member dies, Aranadan performs kali (a dancing ritual); after the night, they bury the person's body. This rite is initiated by the Ooru Moopan, and both male and female members of the community participate. In this rite, the Ooru

Moopan summons the soul of a deceased person and requests that the soul remains with the family. During this ritual, they (members of the colonies) also ask for the treatment of ailments if anyone is sick at the time.

Figure 55Healing experiences shared by individual from Aranadan community

3.6.1.4 Healing Practices among Paniyan\Kattupaniyan

- **Vaishymedukkal**: If a disease or ailment is caused by witchcraft or black magic, the paniyan\kattupaniyan will choose vaishymedukkal. In this method, the Vaishyakkaran applies turmeric paste to the patient's body and begins rubbing the body with jatikka leaves (castor). In this ritual, the Vaishyakkaran also goes into trance after invoking the deity. After entering the trance, he performs an act in which he sucks out the object, such as a nail, throne, or other objects, which is to be inserted into the patient's body by the enemy or sorcerer. They believe that sucking the thing out of the patient will cure him.

- **Vazhipaduvekkal**: This is a preventive cum curative measure in which the patient or the family members offer votives to the deity or the angry spirit like Kuttichathan or kuliyan. The materials that are offered are coconut, rice, fowl's blood etc.

Figure 56 Healing ritual performed by the Kattupaniyan healer

Apart from that, Nair (2010) has discussed several other ritualistic healing practices like Nikalottom, Velikkala, Maraduchavital, Thiriminal and Charadukettal. However, the selected sample population of this study did not mention this ritual healing practice. This implies that Paniyan, being the most populated tribal community and widely distributed in several districts of Kerala, may have diverse ritualistic healing practices that are practised locally. Here are a few extractions (as examples) from the IDIs and FGDs of STCs, in which the informant has described some of the supernatural means of healing.

<Internals\\Interview Transcript\\FGD-A(1-3)-01-20\0305> - § 1 reference coded [8.05% Coverage]

Reference: Nalivekkal and Kali

.....If someone dies in our family, we do kali (a kind of dance ritual) after their burial that night. Ooru Mooppan starts it, and both males and females join him. The Ooru moon evokes the ancestor's soul,

and everyone asks the dead person's soul to remain in their home. Sometimes he\she rejects, and sometimes he\she agrees to remain with the family. The people believe in the grace of that soul. If anyone has a disease in that family, ask that soul to cure it. Family members give money to those who perform ritual ……..on the 7th day, they practise '' Nali Vekkal''. They give their favourite things to the soul and perform Nali vekkal"[80].

<Internals\\Interview Transcript\\IDI-K-01-19\1230> - § 1 reference coded [1.26% Coverage]

...."Mayam mariyal" or " pottithiriyal" is an act of the devil. When a person can't find the way, she or he is trying to find her or his way back home. But he\she can't and will roam all day to find his or her home. This is known as " Mayam mariyal".... We are not using any specific medicine, but we do one thing, i.e. we take our own urine and wash our own face to get rid of this situation[81].

<Internals\\Interview Transcript\\ IDI-C-01-20/0315 > - § 2 references coded [4.38% Coverage]

Reference : Charadorissadu

……we have our own beliefs and culture related to the jungle. We chant mantras while tying up the thread on the arm or waistline or other parts of the body. It is a custom, practised community. When we get fear, we do this[82].

<Internals\\Interview Transcript\\IDI-K-01-19\1230> - § 2 references coded [2.11% Coverage]

[80] Informant No \\ FGD-A (1-3)-01-20\0305 has responded during the IDI among the Aranadan community.
[81] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[82] Informant No \\ IDI-C-01-20\0315 has responded during the IDI among the Cholanaickan community.

Reference: Beedapadu

If a person has any psychological issues, we used to sing a song in praise of God (with biruda music) and do jingling of dried "Beedas" (groundnut) to get rid of that issues. It is known as " beeda padu". The ritual starts from night 8 pm and ends at 12 am[83].

<Internals\\Interview Transcript\\IDI-K-01-19\1230> - § 1
reference coded [0.43% Coverage]

We worship hill god, perform a ritual (koduthi), and offer to god and our grandparents[84].

<Internals\\Interview Transcript\\FGD-K(1-5)-01-20\0112> - § 1
reference coded [1.81% Coverage]

.....suppose if a person has a fever and is in a severe condition, we will take money (panam) and pray to our forefathers and put money in front of God, then we will tie it to his hand[85].

<Internals\\Interview Transcript\\IDI-C-01-20\0315> - § 2
references coded [1.46% Coverage]

Reference: Kariorissadu

..We believe in God other than medicines. Mooppan used to blow patients while chanting mantras with the blessing of our grandparents. We do a (not mention the name) custom for analysing

[83] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[84] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[85] Informant No \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.

disease. He sings a song in praise of God after and then blows the patient using charcoal[86].

<Internals\\Interview Transcript\\IDI-K-06-20\0121> - § 2 references coded [3.59% Coverage]

..we use turmeric powder with rice and chant mantras to remove entered evil spirits from our bodies[87].

<Internals\\Interview Transcript\\IDI-K-01-19\1230> - § 1 reference coded [1.33% Coverage]

If a person has a fever or headache, first we call him\her and blow them. Sometimes it will cure suddenly after that. If it doesn't work, we do the bathing method[88].

We locally call " Anjittu" (disease due to fear) or "Malavilly" (due to fear of the forest), and to get rid of these issues, we use rice and chant mantra, then throw rice[89].

3.6.2 STCs' Healing Through Natural\Physical Means

Healing through natural and physical means includes herbal medicine, animal by-products, minerals and skills like massage etc. These means of healing are primarily employed for diseases that have a simplistic and unelaborated causal explanation. In other words, diseases\illness which have naturalistic explanations can be treated through natural means.

[86] Informant No \\ IDI-C-01-20\0315 has responded during the IDI among the Cholanaickan community.
[87] Informant No \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[88] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[89] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

3.6.2.1 Use of Herbal Medicine

Among all the natural means, the use of herbal medicine is very high. STCs collectively use more than 200 herbal medicinal plants for 50 diseases or illnesses. However, it is important to note that not all the communities of STCs use all medicinal plants. Each community of STCs use separate sets of medicinal plants, however, some medicinal plants are used by two or more communities. The use of herbal medicine ranges from common medicine diseases (like headache, fever and stomachache, toothache etc.) to uncommon diseases (like cancer, kidney stone, urinary infection etc.). It is also important to note here that one medicinal plant is used for multiple diseases and different communities use the different medicinal plants for the same diseases. Therefore, to reduce the complexities and make the findings easy to understand, the researcher has chosen to present findings in the form of three case studies, i.e. Community Wise Case Study (C-Wise), Plant-Wise Case Study (P-Wise) and Disease Wise Case Study (D-Wise).

3.6.2.2 Community Wise Case study (C-Wise)

A total of 214 medicinal plants are recorded to be used for 50 diseases or illnesses. Out of 214 medicinal plants, 62 plants are used by Aranadan, 74 plants by Cholanaickan, 45 plants by Kattuniackan and 83 plants by Paniyan\Kattupaniyan. The complete list of medicinal plants used by the respective communities is listed in Table 1 of Appendix-II. However, as a case study, a nodal network graph (Fig.52) for the medicinal plant use by the respective communities has been presented. In this network graph, the red nodes with a number represent the respective plant from Table-1 of Appendix-II. The blue dot indicates the name of the community. Whereas, the connecting lines visualize the use of the plant by the respective communities. The map was created using UCI Net 6 after converting qualitative data into the quantitative form using binary no. “0” and “1” (as shown in Table-1). The details of the conversion of qualitative data into quantitative data have been discussed in Chapter 2.

(A) (B) (C)

Figure 57 Traditional Medicinal Plant Usage by a Kattunaickan Healer: (a) Nannari (Root - Stomach Diseases), (b) Communist Paccha (Leaf - Wounds), and (c) Panal (Leaf - Fever)

Figure 58Traditional Medicinal Plant Usage by a Kattupaniyan Healer

The results of data analysis show that there are many plants there are being used by all four communities, for example, *Amalpoori* (plant no. 2 in network graph), *Erichavalli* (plant no. 37 in network graph), *Padakizhangu* (plant no. 156 in network graph) etc. Whereas several other medicinal plants are used by more than one community, for

example, *Karlakam* and *Kadaladi* (plant no. 78 and 54 respectively in the network graph) are used by Aranadan, Cholanaickan and Paniyan; *Maramanjal*, *Koduvally*, *Nannari* and *Orilla* (plant no. 118, 96, 140 and 153 respectively in network graph) is used by Aranadan, Kattunaickan and Paniyan; *Nelli*, *Incha* and *Kurumulaku* (plant no. 144, 48 and 107 respectively in network graph) is used by Aranadan and Cholanaickan; *Poopathiri* plant no. 173 in network graph) is used by Kattuanaickan and Chaolanaickan; *Mullilakaya* and *Communist pacha* (plant no. 133 and 28 respectively in network graph) are used by Kattuanaickan and Paniyan; *Kattuchulli* and *Konna* (plant no. 84 and 98 respectively in network graph) are used by Chaolanaicakn and Paniyan; *Karamullu* and *Kurunthotti* (plant no. 74 and 108 respectively in network graph) are used by Aranadan and Kattunaickan, and *Murikootti* and *Pambuvalli* (plant no. 134 and 129 respectively in network graph) are used by Aranadan and Paniyan.

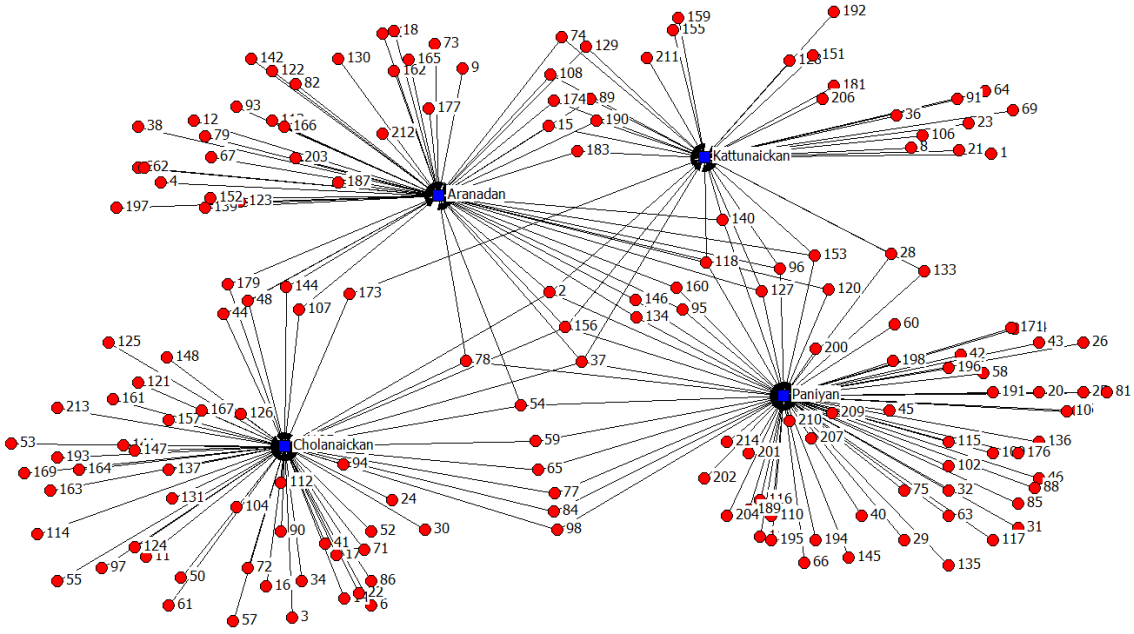

Figure 59 Nodal-network graph for the use of the medicinal plant by the respective communities. (Created using UCI-NET)

Here are a few extracts (as samples) from STCs' IDIs and FGDs where the informant mentioned some of the names of medicinal plants utilised for healing.

<Internals\\Interview Transcript\\ IDI-P-01-20\0111> - § 2

references coded [6.14% Coverage]

Reference : Paniyan\Kattupaniyan

We are collecting medicines from the forest and sell to outsiders. We used to sell the medicines like "Orila, Moovila, Thippali, chorakkuvalli, Eenth(cycas circinalis),Amalpori,Padakizhangu, Nannari, kakkumoranam, Nellikka, Marottikuru and Edampirivalayan[90]*.*

<Internals\\Interview Transcript\\ IDI-C-02-20\0316> - § 1 reference coded [1.17% Coverage]

Reference Cholanaickain

"Kaari, Poopathiri, padakizhangu, Kadikakki etc. we will use the roots of Kaari for stomach pain and Diarrhoea[91]*.*

<Internals\\Interview Transcript\\ IDI-K-05-20\0313> - § 1 reference coded [2.21% Coverage]

Reference Kattuanaickan

Padakizhangu, Orilla, Amalpori, Nagadhanthi, Moovila, Kurumthotti, Palmuthuk, Koombi, wild pepper, Thippali, Shathavari, Cheenikka, uruvanchi, and Neerottikay. We used to collect seeds of poovathi and crush them to extract oil for knee pain and leg pain in those days. It is also good for hair. Now people won't take this seed because it is difficult to make oil. Some people collect oil from Neerottikayya for lighting lamps. Adalodakam and Amalpori are good for stomach pain. The bark of pala is used for

[90] Informant No \\ \\ IDI-P-01-20\0111 has responded during the IDI among the Paniyan community.
[91] Informant No \\ \\ IDI-C-02-20\0316 has responded during the IDI among the Cholanaickan community.

stomach pain. We also use the paste of Padakizhangu for swelling due to snake bites[92].

<Internals\\Interview Transcript\\ FGD-A(1-3)-01-20\0305> - § 6 references coded [15.16% Coverage

Reference Aranadan

We mainly collect medicinal plant like amalpori (Rauvolfia serpentina), incha (Acacia caesia), idampiri valampiri (Helicteres isora), maramanjal (Coscinuim fenestratum), koduveli (Plumbago indica), kurunthotti (Sida retusa), moovila (Psuedartluia viscida), sathavari (Asparagus racemosus), nannari (Hemidesmus in&cus), pambuvali (Sida rhombifolia), padakizhangu (Cyclea peltata), orila (Desmo&um gangeticum) and thippali (Piper longurn)[93].

3.6.2.3 Diseases Wise Case Study (D-Wise)

As mentioned above, STCs employ herbal treatment for both the common and uncommon diseases or illnesses. The result of data analysis shows that there are several diseases for which STCs use more than one medicinal plant. It has also been observed that each community of STCs have separate medicinal plants for the same disease. For example, as shown in Fig. 53, for fever Cholanaickan uses *Kakkathondi* (plant no. 57 from Table 1 of Appendix-II), *kattu inchi* (plant no. 85 from Table 1 of Appendix-II), *Padavally* (plant no. 157 from Table I of Appendix-II, *Panipanal* (plant no. 161 from Table I of Appendix-II), *Punna* (plant no. 180 from Table I of Appendix-II), and *Thanni* (plant no. 185 from Table I of Appendix-II); Kattunaickan uses *Kandavan* (plant no. 68 from Table I of Appendix-II and *Thottavadi* (plant no. 192 from Table I of Appendix-II); Aranadan uses *Erikku* (plant no. 38 from Table I of Appendix-II); Paniyan uses *aral* (plant no. 5 from Table I of Appendix-II), *kattujerakom* (plant no. 85 from Table I of

[92] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[93] Informant No \\ \\ FGD-A(1-3)-01-20\0305 has responded during the FGD among the Aranadan community.

Appendix-II), *macakara* (plant no. 109 from Table I of Appendix-II), *pianisoppu* (plant no. 168 from Table I of Appendix-II) and *Thomaladi* (plant no. 57 from Table I of Appendix-II); Kattuanaickan, Paniyan and Aranadan collectively use *Moovila* (plant no. 127 from Table I of Appendix-II) and Kattuanaickan, Cholanaickan and Aranadan collectively use *Erichilvalli* (plant no. 37 from Table I of Appendix-II). A complete list of different medicinal plants used for similar diseases or illnesses by STCs can be found in Table I in Appendix-II. However, a few network graphs (Fig.53) for some common diseases such as headache, stomachache, toothache, snakebite, and wound and skin diseases have been illustrated below as a case study. The red nodes with a number represent the specific plant from Table-1 of Appendix -II. The blue square denotes the name of the community and the connecting lines with the name of diseases (yellow square) in this network graph describe the use of the medicinal plant for the respective diseases by STCs. The map was created using UCI Net 6 after qualitative input was transformed into the quantitative form using binary values 0 and 1.

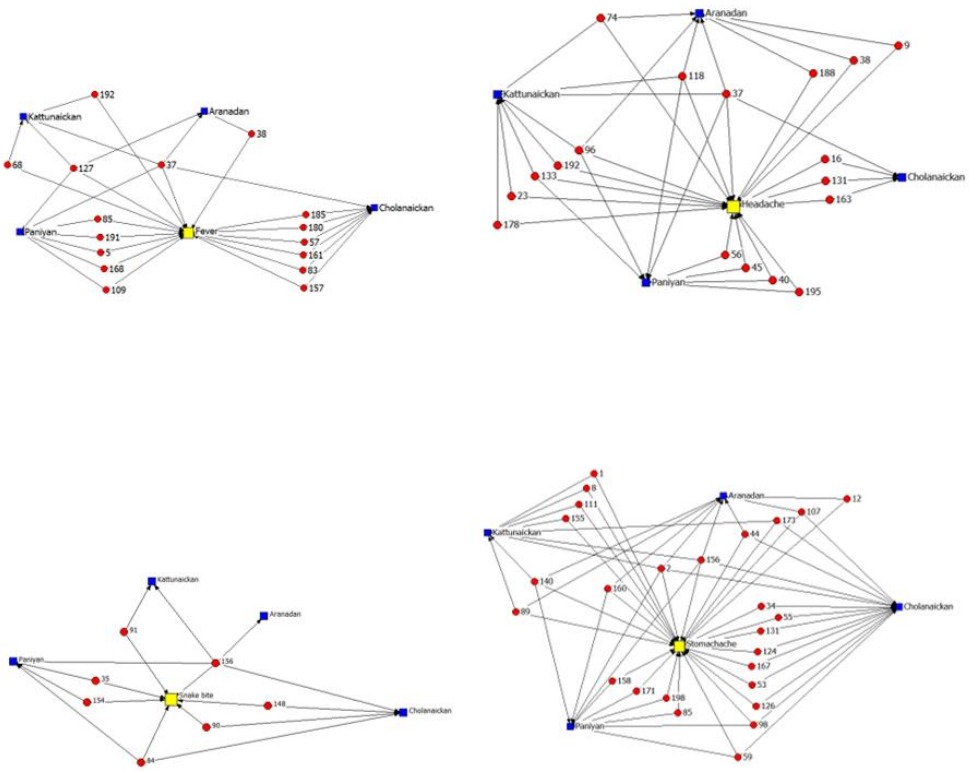

Figure 60 Nodal Graph for disease wise case study

The highest number of plants are used for frequently occurring diseases or illnesses such as stomach-ache (27 plants, 12.616%), toothache (19 plants, 8.878%), wound\cut (13 plants, 6.074%), headache (18 plants, 8.411%), fever (16 plants, 7.476%), snakebite (7 plants, 3.271%), skin diseases (9 plants, 4.205%), bone fracture (7 plants, 3.271%) etc. However, STCs also use herbal medicine for uncommon or rare diseases like Jaundice (2 plants, 0.934%), kidney stone (1 plant, 0.467%)), cancer (1 plant, 0.467%), leprosy (1 plant, 0.467%), paralysis (4 plants, 1.401%) Graph-1 (Fig. 54) shows the number of plants used for some of the common diseases. After correlating the number of plants utilised by STCs for a specific disease with the frequency of disease occurrence, it was discovered that STCs had a greater number of plants for diseases with a high-frequency rate of occurrence. The complete chart of diseases with the number of plants used for diseases is enlisted in Table I of Appendix II.

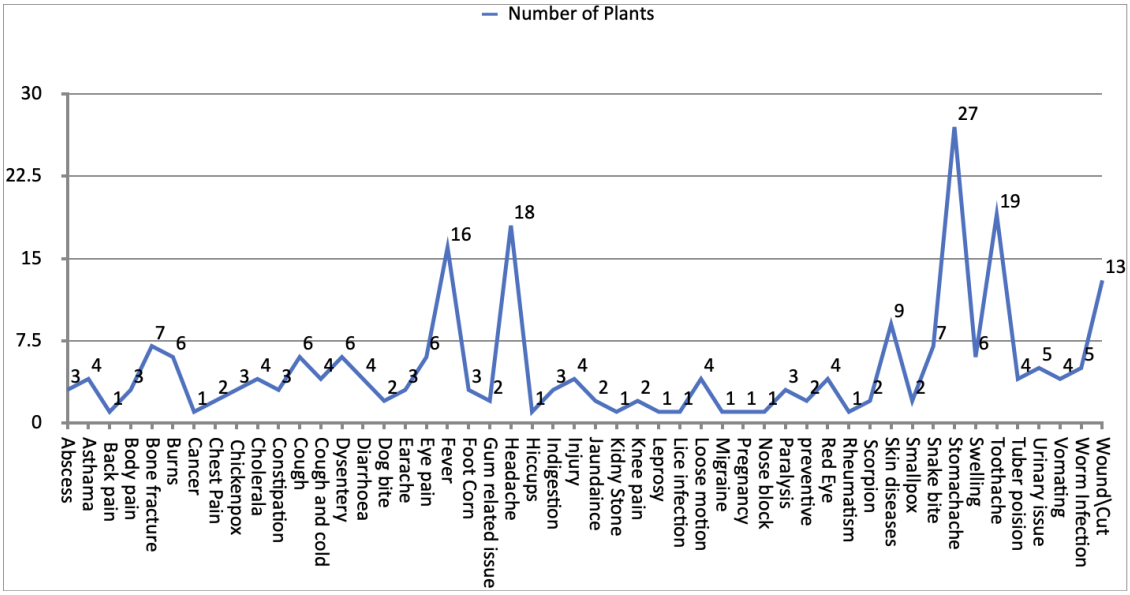

Figure 61 Number of plants used for each disease.

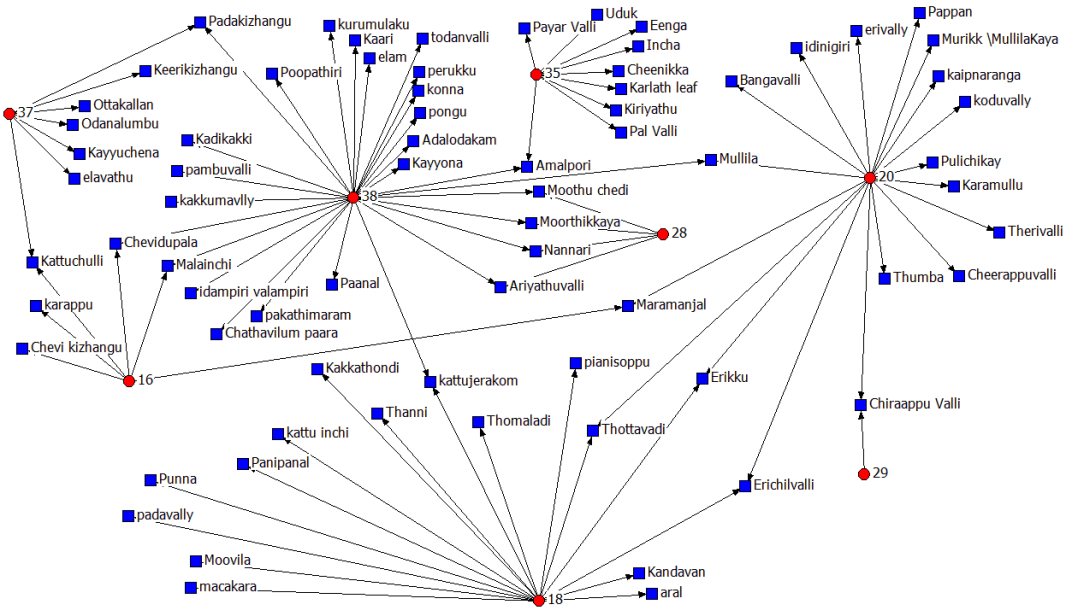

Figure 62 Network graph for the use of the medicinal plant for respective diseases.

Table I of Appendix II has a complete list of medicinal plants used for various diseases. In addition, a network graph (Fig. 55) of the use of the medicinal plant for a few diseases has been shown as a case study. The red nodes with a number in this network graph indicate the respective diseases from Table I of Appendix II, and reconnecting lines with a blue square with the plant's name show the number of plants used by the particular communities. After transforming qualitative data into quantitative form using binary numbers 0 and 1, the network graph was built using UCI Net 6. Here value "0" is for no use, and "1" is for use.

As previously stated, STCs employ herbal medicine to treat ailments whose origin and cause can be traced back to a naturalistic explanation. Here are a few (as samples) extracts from STCs in which the informant discusses some of the most common ailments and their herbal cures.

- **Fever**

<Internals\\Interview Transcript\\ IDI-K-06-20\0121> - § 2 references coded [1.45% Coverage]

"Erichil Valli" (climber) is used to burn. It is mainly for colds, headaches and fever[94].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20\0314 > - § 5 references coded [3.64% Coverage]

Cold fever is common. we use Mullila. (He is showing the tree)[95].

Kakkathondi is good medicine for cold. It is a climber[96].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112> - § 4 references coded [4.69% Coverage]

we are still using a medicinal plant called " Murivootty or Murivootty"(wound healing plant). We have to crush these leaves directly on row wounds. Mainly " Murivootty" is used for fever[97].

<Internals\\Interview Transcript\\ IDI-K-05-20\0313> - § 1 reference coded [0.64% Coverage]

Reference 1 - 0.64% Coverage

we use the paste of leaves of Thottavadi (same plant or touch me not plant), which is good for headaches and colds[98].

- **Headache**

[94] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[95] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[96] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[97] Informant No \\ \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[98] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.

<Internals\\Interview Transcript\\ FGD-K(1-6)-02-20\0204> - § 1 reference coded [3.22% Coverage]

We collect Thippali, Pulichikay and fruit of ' Mullu maram '. It is commonly known as " Mullila Kaya "[99].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20\0314 > - § 2 references coded [0.72% Coverage]

Cheerappuvalli is used for headaches is used for it. It grows here[100].

<Internals\\Interview Transcript\\ IDI-P-01-20\0111> - § 2 references coded [5.70% Coverage]

We use "Muliyilakkay" and Mud dauber's mud for headaches. These two are a grind, then mix well together and apply over the forehead. Our ancestors didn't tell the medicine's name. Medicines for TB and headaches can be seen in the forest. We don't know the names but can identify them[101].

<Internals\\Interview Transcript\\ IDI-K-04-20\0202 > - § 2 references coded [4.89% Coverage]

We are using a paste of " Thottavadi "(Shame plant) leaves and applying it over the forehead. It is a medicine for headaches[102].

- **Snake bites**

[99] Informant No \\ \\ FGD-K(1-6)-02-20\0204 has responded during the FGD among the Kattunaickan community.
[100] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[101] Informant No \\ \\ IDI-P-01-20\0111 has responded during the IDI among the Paniyan community.
[102] Informant No \\ \\ IDI-K-04-20\0202 has responded during the IDI among the Kattunaickan community.

<Internals\\Interview Transcript\\ IDI-K-06-20\0121 > - § 1 reference coded [0.87% Coverage]

"Keeri kizhangu" is used for it. It grows among rocks. The price is 200 when we buy from outside[103].

<Internals\\Interview Transcript\\ FGD-K(1-6)-02-20\0204 > - § 2 references coded [2.75% Coverage]

" otta Padam and karlakam " are the medicines for snake bites[104].

We apply the paste of karlakam and raw turmeric at the site of the bite[105].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20\0314 > - § 1 reference coded [0.51% Coverage]

'Amalpori' is best for churutta's bite[106].

<Internals\\Interview Transcript\\ IDI-P-01-20\0111 > - § 1 reference coded [0.26% Coverage]

Amalpori is used for snake bite[107].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112 > - § 1 reference coded [1.73% Coverage]

[103] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[104] Informant No \\ \\ FGD-K (1-6)-02-20\0204 has responded during the FGD among the Kattunaickan community.
[105] Informant No \\ \\ FGD-K (1-6)-02-20\0204 has responded during the FGD among the Kattunaickan community.
[106] Informant No \\ \\ FGD-C (1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[107] Informant No \\ \\ IDI-P-01-20\0111 has responded during the IDI among the Paniyan community.

We are using "karlakam", a creeper used for tying up and taking its tuber, grinding it and making it a paste and apply on the bitten area[108].

Amalpori is not used for it. We use another plant " Naruk" or "cheriya naruk". We take its tuber, grind it to make a paste, and then apply[109].

<Internals\\Interview Transcript\\ IDI-K-02-20\0114 > - § 2 references coded [0.61% Coverage]

"Amalpori" is a medicine. We also are using "otta Padam". I don't know other medicine names[110].

<Internals\\Interview Transcript\\ IDI-K-04-20\0202 > - § 1 reference coded [1.88% Coverage]

Karlakam and turmeric are medicines for mild poison. It is used mainly used for " churutta's" bite[111].

<Internals\\Interview Transcript\\ IDI-K-05-20\0313 > - § 4 references coded [1.61% Coverage]

somebody from this colony gives medicine for snake bites. " Padakizhangu" is a creeper, and it has round leaves. We collect their root tuber and make it as a paste. Then apply over the bitten site to reduce swelling[112].

[108] Informant No **\\ ** FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[109] Informant No **\\ ** FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[110] Informant No **\\ ** IDI-K-02-20\0114 has responded during the IDI among the Kattunaickan community.
[111] Informant No **\\ ** IDI-K-04-20\0202 has responded during the IDI among the Kattunaickan community.
[112] Informant No **\\ ** IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.

Padakizhangu is used for mild poisonous snake bites like ' Churutta's bite. Amalpori for skin diseases[113].

Padakizhangu is also used for snake bites. We also use the paste of Padakizhangu for swelling due to snake bites[114].

- **Burning**

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20\0314 > - § 1 reference coded [0.17% Coverage]

Honey is best for the burned area[115].

<Internals\\Interview Transcript\\ IDI-K-05-20\0313 > - § 1 reference coded [0.28% Coverage]

Amalpori is good medicine for injuries, itching and bruising[116].

- **Ear pain**

<Internals\\Interview Transcript\\ IDI-K-06-20\0121> - § 1 reference coded [0.82% Coverage]

"Chevi kizhangu" is used to Crush and apply ear-related problems. It grows among rocks[117].

[113] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[114] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[115] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[116] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[117] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.

<Internals\\Interview Transcript\\ IDI-K-04-20\0202 > - § 1 reference coded [2.43% Coverage]

The leaves of " Chevidupala" have been made to warm and squeeze them, take the juice and pour] ear to get rid of the pain[118].

- **Eye Pain**

<Internals\\Interview Transcript\\ IDI-K-01-19\1230> - § 1 reference coded [1.12% Coverage]

We use the varamanjal(the type of turmeric); we break those cord and take the liquid inside them and drop it into the eyes. It will cure eye problems[119].

- **Skin Diseases**

<Internals\\Interview Transcript\\ IDI-K-06-20\0121> - § 1 reference coded [2.37% Coverage]

The roots of " Pal Valli" are added to water and taken a bath for children. It will help prevent skin diseases.
Simply squeeze it and apply it to the wound. Most plants growing here have medicinal quality[120].

<Internals\\Interview Transcript\\ IDI-K-02-20\0114 > - § 1 reference coded [0.80% Coverage]

[118] Informant No \\ \\ IDI-K-04-20\0202 has responded during the IDI among the Kattunaickan community.
[119] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[120] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.

The skin of "Eenga" (a kind of creeper) has to crush and rub over the body during a bath[121].

<Internals\\Interview Transcript\\ IDI-K-05-20\0313 > - § 3 references coded [0.98% Coverage]

'Amalpori' is another medicinal plant used for skin diseases like itching etc[122].

We have to make a powder of Amalpori and mixed with Onion, then boil them with oil. It is good for skin diseases[123].

Amalpori is good medicine for injuries, itching and bruising[124].

- **Stomachache**

<Internals\\Interview Transcript\\ IDI-K-06-20\0121> - § 1 reference coded [0.80% Coverage]

Padakizhangu is used for stomach aches. Its leaves paste good to remove dandruff[125].

<Internals\\Interview Transcript\\ IDI-K-01-19\1230 > - § 1 reference coded [1.62% Coverage]

Moothu chedi(moothu plant) is used to make it as liquid and drink; it has a bitter taste. And sometimes we make it a small capsule and

[121] Informant No \\ \\ IDI-K-02-20\0114 has responded during the IDI among the Kattunaickan community.
[122] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[123] Informant No \\ \\ IDI-K-05-20\0313has responded during the IDI among the Kattunaickan community.
[124] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[125] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.

swallow it. So, even though they are splitting or vomiting blood, that will be stopped within four days[126].

<Internals\\Interview Transcript\\ FGD-K(1-6)-02-20\0204> - § 2 references coded [2.87% Coverage]

"Padakizhangu" is for stomach pain. : It prevents bleeding during loose motion. It is purifying blood[127].
we are using 'Nannari' (Sarsaparilla)[128].

The crushed skin of "Ariyathuvalli" is also used for the same purpose[129].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20\0314> - § 3 references coded [2.09% Coverage]

It is known as " Moorthikkaya"(a kind of fruit) and can be seen in the forest. It is a long kind of fruit; the seed has a bitter taste and is used for stomach pain[130].

This is a leaf of " Poduvanni"(a kind of plant), isn't it?
Kariyan: No. It is " Mullila"[131].

Kullan Chathan: For dental pain and stomach pain[132].

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[126] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[127] Informant No \\ \\ FGD-K(1-6)-02-20\0204 has responded during the FGD among the Kattunaickan community.
[128] Informant No \\ \\ FGD-K(1-6)-02-20\0204 has responded during the FGD among the Kattunaickan community. .
[129] Informant No \\ \\ FGD-K(1-6)-02-20\0204 has responded during the FGD among the Kattunaickan community.
[130] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[131] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[132] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.

Kullan Chathan: Bark of " Poopathiri" is used for stomach pain[133].

<Internals\\Interview Transcript\\ IDI-K-02-20\0114 > - § 3 references coded [1.70% Coverage]

Padakizhangu is used for stomach pain[134].

No. It's a small plant. We are using its root.
Kumaran: For stomach pain[135].

Padakizhangu for stomach ache[136].

<Internals\\Interview Transcript\\ IDI-K-04-20\0202 > - § 1 reference coded [1.31% Coverage]

"pada kizhangu" is mainly used for stomach pain. It can be squeezed and taken into the juice[137].

<Internals\\Interview Transcript\\ IDI-C-02-20\0316> - § 8 references coded [6.19% Coverage]

"Pada kizhangu "(a kind of tuber) is good for stomach pain[138].

Sometimes will take the bark of "Poopathiri" (a kind of tree) for stomach pain[139].

[133] Informant No **\\ ** FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.
[134] Informant No **\\ ** IDI-K-02-20\0114 has responded during the IDI among the Kattunaickan community.
[135] Informant No **\\ ** IDI-K-02-20\0114 has responded during the IDI among the Kattunaickan community.
[136] Informant No **\\ ** IDI-K-02-20\0114 has responded during the IDI among the Kattunaickan community.
[137] Informant No **\\ ** IDI-K-04-20\0202 has responded during the IDI among the Kattunaickan community.
[138] Informant No **\\ ** IDI-C-02-20\0316 has responded during the IDI among the Cholanaickan community.
[139] Informant No **\\ ** IDI-C-02-20\0316 has responded during the IDI among the Cholanaickan community.

" Kaari, Poopathiri, padakizhangu, Kadikakki, etc.". we will use the roots of Kaari for stomach pain and Diarrhoea[140]

<Internals\\Interview Transcript\\ IDI-K-05-20\0313> - § 4 references coded [1.60% Coverage]

Adalodakam and Amalpori are good for stomach pain. The bark of the pala is used for stomach pain[141].

Amalpori, Padakizhangu and nannari are good medicines for stomach pain[142].

Padakizhangu and Amalpori. Amalpori has to be crushed and take its juice to drink[143].

'Poopathiri, Kayyona. Paanal' is used.[144]

- **Tooth Pain**

<Internals\\Interview Transcript\\ IDI-K-06-20\0121> - § 1 reference coded [1.48% Coverage]

'Murivootty' is a medicinal plant. Kottapazham's (a fruit) root is used for crushing, and it can be added to hot water when you are steaming; it will help get rid of toothache[145].

<Internals\\Interview Transcript\\ IDI-K-04-20\0202> - § 2 references coded [3.82% Coverage]

[140] Informant No \\ \\ IDI-C-02-20\0316 has responded during the IDI among the Cholanaickan community.
[141] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[142] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[143] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[144] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[145] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.

The root of " Chippali" has to crush and is directly applied to a painful tooth to relieve the ache[146].

<Internals\\Interview Transcript\\ DI-K-05-20\0313> - § 1 reference coded [0.35% Coverage]

We take the skin of Poopathiri. 'Ennakkara' is a tree; its bark is a good remedy for toothache[147].

- **Paralysis**

<Internals\\Interview Transcript\\ IDI-P-01-20\0111 > - § 1 reference coded [0.73% Coverage]

"Ungu" is a tree used for paralysis."Poyavanna", "Thoutha " are other medicinal plants[148].

- **Kidney Stone**

<Internals\\Interview Transcript\\ IDI-K-02-20\0114> - § 1 reference coded [0.81% Coverage]

Yes, it is. We can add Koova with Kalluvazha flour, the best medicine for kidney stones[149].

- **Urinary problem**

[146] Informant No \\ \\ IDI-K-04-20\0202 has responded during the IDI among the Kattunaickan community.
[147] Informant No \\ \\ DI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[148] Informant No \\ \\ IDI-P-01-20\0111 has responded during the IDI among the Paniyan community.
[149] Informant No \\ \\ IDI-K-02-20\0114 has responded during the IDI among the Kattunaickan community.

<Internals\\Interview Transcript\\ IDI-K-02-20\0114> - § 1 reference coded [0.56% Coverage]

"Koova "(Arrow root) is a medicine used for urinary problems[150]*.*
(Didn't answer)

<Internals\\Interview Transcript\\ IDI-K-05-20\0313> - § 1 reference coded [0.74% Coverage]

The seed of Kalluvazha is used for urinary infections. We use Kallurmanji (actually Kallurvanchi, Aquatic rotula) and another kind of Manji[151]*.*

- **Wound**

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112 > - § 2 references coded [1.27% Coverage]

we are still using a medicinal plant called " Murivootty or Murivootty"(wound healing plant). We have to crush these leaves directly on row wounds[152]*.*

Not that one. But we used communist appa also. That plant was growing here and got burned now. Its leaf is round in shape. So we can use it when we get wound[153]*.*

[150] Informant No \\ \\ IDI-K-02-20\0114 has responded during the IDI among the Kattunaickan community.
[151] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[152] Informant No \\ \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[153] Informant No \\ \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.

<Internals\\Interview Transcript\\ IDI-C-02-20\0316> - § 1 reference coded [2.50% Coverage]

A plant " Pisila"(local name) their leaves will take and grind into a paste. And apply in the injured area. We should apply it 2or 3 days then it will cure. It can be used for the burned area[154].

In addition to the aforementioned characteristics, the study discovered that STCs, unlike biomedicine, do not generally group diseases into multiple subtypes. They did not, for example, categorised fever into subtypes such as malaria, viral fever, chikungunya, and so on. They do, however, distinguish subgroups based on their naturalistic and supernaturalistic causation factors. It is also worth noting that they employ the same medicine to treat all subtypes of the same diseases except when they suspect the disease is caused by supernaturalistic force, in which case they apply the ritualistic treatment.

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112> - § 4 references coded [4.69% Coverage]

Yes, there are different varieties of fever. But we use one method for all fevers[155].

<Internals\\Interview Transcript\\ IDI-C-01-20\0315 > - § 1 reference coded [0.61% Coverage]

All tribes are aware of snakes, and we have several names for snakes in our language. We don't have separate medicines for different snakes bite[156]

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112> - § 1 reference coded [0.74% Coverage]

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[154] Informant No \\ \\ IDI-C-02-20\0316has responded during the IDI among the Cholanaickan community.
[155] Informant No \\ \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[156] Informant No \\ \\ IDI-C-01-20\0315 has responded during the IDI among the Cholanaickan community.

…We use the same plant. Sometimes we won't use the medicine[157].

3.6.2.4 Plant-wise Case Study (P-Wise)

The use of a certain plant for the same major purpose or the diversity of use of certain plants within the community and inter-community level is critical to comprehend. It aids in determining the relative use of plants across cultures. The results of the data analysis of the plants reported by STCs show that plants like Amalpoori (plant no. 2 in Table -I of Appendix II) are used for the same and distinct purposes by all four STC communities. As an example. Amalpoori is used by the Pinyan group for snake bites, while Kattunaickan, Aranadan, and Cholanaickan utilise it for stomach problems. Kattunaickan also uses it to treat skin diseases, injuries, and other ailments. The complete list of plant-specific case studies can be found in Table I of Appendix II; however, as an example, a nodal network graph (Fig. 56) has been presented in which the red nodes with a number represent the specific plant from Table I of Appendix II, the blue square represents the names of diseases mentioned by STCs, and the connecting lines with diseases and plant in this network graph describe the use of the medicinal plant for the respective diseases by STCs. The map was built with UCI Net 6 after the qualitative data was converted to binary values of 0 and 1 to create a quantitative form.

Here are a few extractions as an example that show the diversity of the use of plant Amalpoori by STCs.

<Internals\\Interview Transcript\\ IDI-P-01-20\0111 > - § 4 references coded [0.26% Coverage]

[157] Informant No **\\ ** FGD-K (1-5)-01-20\0112 has responded during the IDI among the Kattunaickan community.

Amalpori is used for snake bite[158]

<*InternalsInterview Transcript*\\ *IDI-K-05-20\0313*> - § 9 references coded [0.26% Coverage]**

....Amalpori is for skin diseases[159]*.*

....Adalodakam and Amalpori are good for stomach pain[160]

...Amalpori is good medicine for injuries[161]

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[158] Informant No \\ \\ IDI-P-01-20\0111has responded during the IDI among the Paniyan community.
[159] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[160] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[161] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.

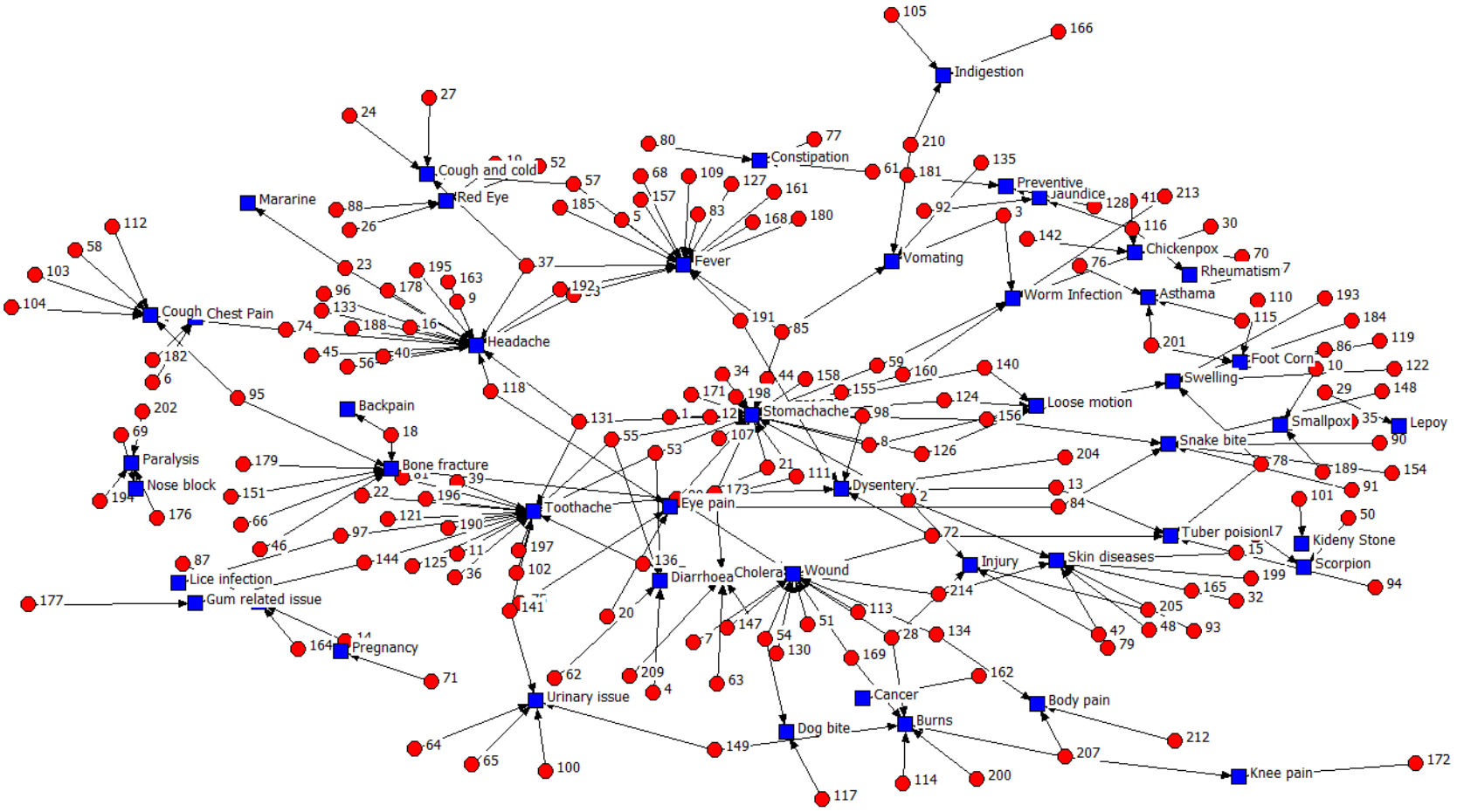

Figure 63 A Nodal graph for the use of medicinal plants for the respective diseases.

3.6.3 Use of Animal and Animal By-products

In addition to herbal therapy, STCs use a variety of animal by-products for healing. They use a variety of animals and reptiles, including elephants, deer, boar, leopards, fish, and snakes. The data analysis revealed that not every STCs uses all animal by-products; nevertheless, a few animal by-products have been used throughout communities, such as elephant tooth, which the Kattunaickan, Cholanaickan, Aranadan, and Paniyan people use for tooth pain. Table II of Appendix-II contains a comprehensive list of animal by-products and their use for various diseases. However, as an example, a nodal network (Fig. 57) graph representing the use of animal by-products for the respective diseases by the STCs is shown here as a case study. In this nodal graph, the name of the community is represented by the large yellow square, the name of the disease is represented by the small blue square, and the name of the animal by-product is represented by the red dot. This graph, like the nodal graph of plants, is produced using the binary integers "0" and "1" with the help of UCI-Net.

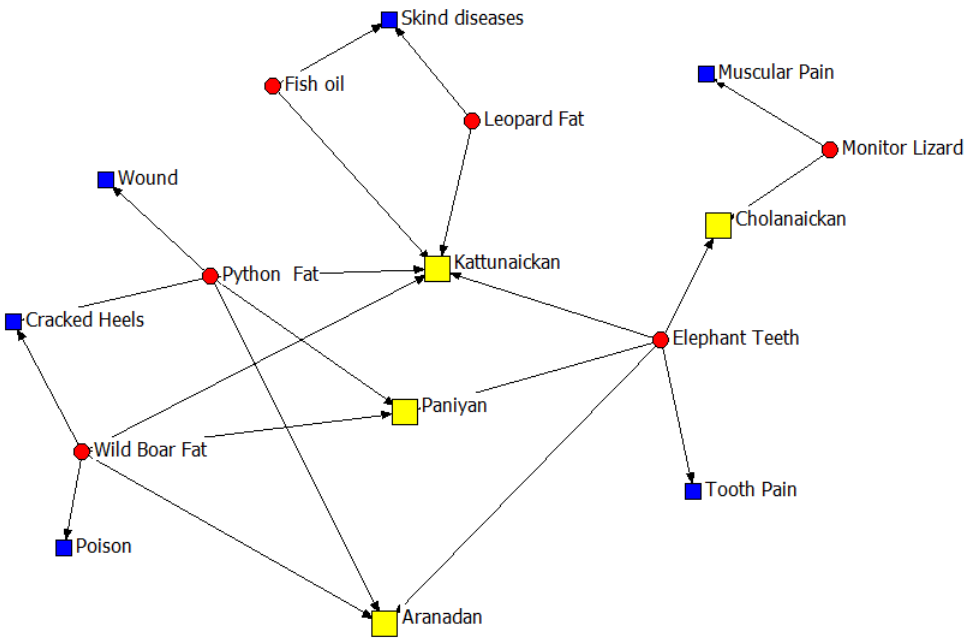

Figure 64 A nodal graph for the use of animal by-products for healing

The following are a few extractions as examples of STCs' usage of animal by-products for healing purposes.

<Internals\\Interview Transcript\\ IDI-K-06-20\0121> - § 1
reference coded [2.95% Coverage]

Reference: Elephant tooth, tiger, boar and python fat

Elephant tooth for tooth pain, fat of tiger, boar, Pythons and oil of fish are also used as medicines[162].

<Internals\\Interview Transcript\\ IDI-K-01-19\1230 > - § 1
reference coded [2.12% Coverage]

Reference: Elephant teeth

For the children, there are some problems like newly formed, at that time, we use the elephant teeth powder and put the paste of it on the outside of their cheeks. This will cure their fever and slow down their corner teeth formation[163].

<Internals\\Interview Transcript FGD-C(1-4)-01-20\0314 > - § 1
reference coded [0.41% Coverage]

Reference: Elephant tooth

yes. It is for dental pain[164].

[162] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[163] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[164] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.

<Internals\\Interview Transcript\\ IDI-C-02-20\0316 > - § 1
reference coded [1.96% Coverage]

Reference: Monitor lizard

We use the fat of 'monitor lizard' for muscular pain[165].

<Internals\\Interview Transcript\\ IDI-K-06-20\0121 > - § 1
reference coded [0.62% Coverage]

Reference: Boar fat

we are using the fat of wild boar for poison. It is a secret[166].

<Internals\\Interview Transcript\\ IDI-K-01-19\1230 > - § 1
reference coded [0.98% Coverage]

Reference : Boar and python

fat of boar, Python etc., are used for cracked heels[167].

<Internals\\Interview Transcript\\ IDI-K-06-20\0121 > - § 1
reference coded [0.75% Coverage]

Reference: Python

Researcher: what are the uses of Pythons fat?
... It is great medicine for a wound[168].

[165] Informant No \\ \\ IDI-C-02-20\0316 has responded during the IDI among the Cholanaickan community.
[166] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[167] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[168] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.

<Internals\\Interview Transcript\\ IDI-K-01-19\1230 > - § 1
reference coded [0.68% Coverage]

Reference Python

we used python's fat for cracked heels in early times[169].

<Internals\\Interview Transcript\\ IDI-K-06-20\0121 > - § 1
reference coded [0.99% Coverage]

Reference: fish oil

fish oil is great for skin and is also used to enhance immunity[170].

<Internals\\Interview Transcript\\ IDI-K-06-20\0121 > - § 2
references coded [2.48% Coverage]

Reference: leopard and pig

Researcher: what about the leopard and pig fat?
These are commonly used in Ambumala and Vettilakolli colonies. It is used for skin diseases[171].

3.6.4 Use Skills and Other Natural Means

In addition to the use of herbal medicine and animal by-products, STCs also uses a special set of skills like massage, use of minerals and human by-product for healing. Chaolanaickan, for example, employs massage techniques such Pidichukodukkal (headache massage by family members) and Oddanereyaakal (massage of stomach

[169] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[170] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[171] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.

ailment by elderly women.) Kattunaickan, on the other hand, treats bone dislocations, infant ultra-position and misplacement of the inner organs with his massage abilities. It is worth noting that both the Cholanaickan and the Kattuanaickan believe that stomach ailment is caused by internal organ dislocation, which can be addressed with the physical massage. It was also fascinating to note that a few individuals in the community have a sound understanding of the number of bones and bone joints in each part of the body. The following are a few examples from STC's IDI and FGD where informants mentioned massage as a skill.

<Internals\\Interview Transcript\\ IDI-K-05-20\0313 > - § 2 references coded [8.91% Coverage]

Reference: Treating Pregnant lady

I can understand by touching the belly. We didn't learn scientifically. We got the knowledge through generations. When the uncle goes to check on a pregnant lady, two or three ladies will join him. Then they will be able to know what happened inside of her womb[172].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20\0314 > - § 1 reference coded [0.49% Coverage]

Reference: Sprain

when I have sprained ankle, we massage with oil (Thailam). For bone breakage, I will approach the hospital[173].

[172] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[173] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Cholanaickan community.

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20\0112 > - § 1 reference coded [0.40% Coverage]

Reference: Bone fracture

we massage with" thailam" (oil), make a creeper paste, and apply it over the fracture[174].

<Internals\\Interview Transcript\\ IDI-K-05-20\0313 > - § 1 reference coded [2.42% Coverage]

Reference: Ultra position

A pregnant woman is suffering some issues. Such as the ulta position (not breech position). The vaidyan can find out the problem by touching her belly on those days. Then they used oil to normalise the child's position in the womb. Now we can go to the hospital to scan[175].

Apart from skills like massages, STCs also use minerals like iron and human by-products such as breast milk and urine for healing purposes. For example, iron is used for epilepsy, breast milk is used for an eye infection, and urine is used for the treatment of Mayam Mariyal or pottithiriyal.

The following are a few examples of informants mentioning massage as a skill in STC's IDI and FGD.

<Internals\\Interview Transcript\\ IDI-K-01-19\1230 > - § 1 reference coded [0.49% Coverage]

Reference: Use of Iron

[174] Informant No \\ \\ FGD-K(1-5)-01-20\0112 has responded during the FGD among the Kattunaickan community.
[175] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.

No. But use iron pieces for epilepsy[176].

<Internals\\Interview Transcript\\ IDI-K-01-19\1230 > - § 1 reference coded [1.26% Coverage]

Reference: Use of Human Urine

...."Mayam mariyal" or " pottithiriyal", they believe this is an act of the devil. When a person can't find the way, she or he is trying to find her or his way back home. But they can't, and they will roam all day to find their home. This is known as " Mayam mariyal". ……..not using specific medicine but do one thing, i.e. we will take our own urine and wash our own face[177].

<Internals\\Interview Transcript\\ IDI-K-06-20\0121 > - § 1 reference coded [0.77% Coverage]

Reference: Use of breast milk

Breast milk is good for eye infections[178].

<Internals\\Interview Transcript\\ IDI-C-02-20\0316 > - § 1 reference coded [3.36% Coverage]

Reference: Use of Stone

"Kanmadham" (viscous rock)is a kind of stone, mainly in red and black colour. It can be seen in streams. We have heard it from outsiders. We are using it as medicine[179].

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[176] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[177] Informant No \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[178] Informant No \\ \\ IDI-K-06-20\0121 has responded during the IDI among the Kattunaickan community.
[179] Informant No \\ \\ IDI-C-02-20\0316 has responded during the IDI among the Kattunaickan community.

3.7 Other Decision-making Process Involved in STCs Natural Healing Practices.

STCs also entail a few additional critical decision-making processes in the course of healing, which makes their healing process more complex. As a result, it is necessary to explore some of the critical decision-making processes involved in STCs' healing practices in order to contextualise the STCs' dynamic ways of managing their ill health.

a. ***Methods and Modes of selection and collection of herbal medicine:*** STCs do not collect and keep medicine in advance; instead, they approach the catchment area and gather medicine as needed. STCs do not cultivate medicine; instead, they use wild medicine that is stored in ecology[180] in its natural state (rather than processed form), and they collect medicine based on immediate requirements rather than future needs and storage. It is also important to highlight that STCs undertake a certain ritual and adhere to a strict timetable while collecting medicine from the forest. In addition to the aforesaid requirements, they also utilise specific tools to collect the medication since they believe that collecting medicine with non-specified tools can result in the loss of that medicine's healing ability. For example,

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<Internals\\Interview Transcript\\ IDI-K-03-20/0115> - § 2 references coded [4.25% Coverage]

Reference: Ecological Storage

This type of difficult situation is happening in summer. We can't get some medicines at that time in our area. There is no one collecting those medicine in advance. If we need any medicine urgently, we collect the medicine from the inside forest. Because

[180] Kindly refer the next chapter to know more about ecological stotage.

that forest area is very cold. So all herbal medicine like plants, roots, leaves, creeps, etc. is always available there[181].

<Internals\\Interview Transcript\\ IDI-P-01-20/0111> - § 1 reference coded [3.49% Coverage]

Reference: Ecological Storage

A creeper is used for migraine. Women will have migraine more than men. A few years ago I gave this to a woman who had a migraine and got married to Wayanad. She was a child at that time and I told her this migraine won't come to her again. A few days ago Rajan wants this medicine I searched here but I can't find it. If it needs we have to go to the dense forest[182].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20/0112> - § 2 references coded [2.44% Coverage]

Reference: Ritual before collecting medicine

Yes. We take money and chant then ties it up in the hands or forehead[183].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20/0112> - § 1 reference coded [0.65% Coverage]

Reference: Time of medicine collection

we used to go in the early morning[184].

[181] Informant No **\\ ** IDI-K-03-20/0115 has responded during the IDI among the Kattunaickan community.
[182] Informant No **\\ ** IDI-P-01-20/0111 has responded during the IDI among the Paniyan community.
[183] Informant No **\\ ** FGD-K(1-5)-01-20/0112 has responded during the FGd among the Kattunaickan community.
[184] Informant No **\\ ** FGD-K(1-5)-01-20/0112 has responded during the FGd among the Kattunaickan community.

<Internals\\Interview Transcript\\ IDI-C-01-20/0315> - § 1
reference coded [1.24% Coverage]

Reference: Use of specific tools

We are using a sharp stick and stone. Some plants should be plucked by hand and should use tools[185].

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b. ***Dosage Decision-making Process:*** It is one of the most critical decision-making processes for STCs during their natural healing processes. STC's dosage decisions, like those of other medical traditions, are based on the patient's age and the severity of the disease condition. For example, they may give a youngster a new little leaf of a medical plant, whereas adults are advised to consume large medicinal plant leaves. They are, however, unconcerned about the dosage of a few herbal medicines since they feel that the herbal medicine they use has no negative effects and is always beneficial to their health. The following are a few examples from STCs' IDI and FGDs in which they discuss how they decide on a patient's dosage.

<Internals\\Interview Transcript\\ IDI-C-01-20/0315 > - § 2
references coded [1.42% Coverage]

Reference 2 - 0.72% Coverage

No. We used to give newly grown leaves to children and other leaves given to elder people[186].

<Internals\\Interview Transcript\\ IDI-K-03-20/0115 > - § 2
references coded [2.29% Coverage]

[185] Informant No \\ \\ IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community.
[186] Informant No \\ \\ IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community.

Reference 1 - 1.26% Coverage

The dosage doesn't matter in herbal treatment. It doesn't have any side effects. It's always good for health[187].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20/0314> - § 1 reference coded [0.47% Coverage]

Reference 1 - 0.47% Coverage

One seed is enough for both children and adults. (They are showing seed size)[188].

<Internals\\Interview Transcript\\ IDI-C-02-20/0316> - § 4 references coded [3.30% Coverage]

References 2-4 - 2.49% Coverage

We don't take medicines like that. There are no side effects of the medicine[189].

<Internals\\Interview Transcript\\ IDI-K-06-20/0121> - § 1 reference coded [0.84% Coverage]

Reference 1 - 0.84% Coverage

Smelling the smoke two times is enough for children[190].

<Internals\\Interview Transcript\\ IDI-K-05-20/0313> - § 1 reference coded [1.15% Coverage]

[187] Informant No **\\ ** IDI-K-03-20/0115 has responded during the IDI among the Kattunaickan community.
[188] Informant No **\\ ** FGD-C(1-4)-01-20/0314 has responded during the FGD among the Cholanaickan community.
[189] Informant No **\\ ** IDI-C-02-20/0316 has responded during the IDI among the Cholanaickan community.
[190] Informant No **** IDI-K-06-20/0121 has responded during the IDI among the Kattuanaickan community.

Reference 1 - 1.15% Coverage

We give less quantity to children and add more to adults[191].

3.8 Western Medicine and STCs

As mentioned earlier, STCs along with their own medicine also consult western medicine for healing. They consult western medicine in the following circumstances:

a. If a disease is prolonged and severe and is not cured by traditional medicine.
b. At times, when community members are unable to find. It is vital to emphasise that because they use an ecological storage system, and do not collect and preserve medicine in advance.
c. If a western medicine doctor pays a visit to their colony or settlement area.
d. When medicines in the catchment region are destroyed by natural disasters (such as floods or droughts) or are unavailable when needed.
e. If an individual (especially the younger generation) lacks knowledge of medicine.
f. If traditional medicine doesn't suit the individual.
g. In the case of an epidemic
h. In the case of a serious accident and injury
i. In case of a complicated delivery.

The following are a few examples from STC's IDI and FGD in which Informant mentioned the above-mentioned situation to consult a western medication or doctor.

<Internals\\Interview Transcript\\ IDI-C-01-20/0315> - § 1 reference coded [0.35% Coverage]

Reference: Traditional medicine fails to cure

[191] Informant No \\ \\ IDI-K-05-20/0313 has responded during the IDI among the Kattuanaickan community.

If it doesn't cure the healers have to realise it is another disease, then go to the hospital[192]

<Internals\\Interview Transcript\\ IDI-K-01-19/1230> - § 2 references coded [1.56% Coverage]

Reference: Epidemic like cholera

No one is affected in recent times, but a few years back some of us were affected by it for a week and we use English medicines to cure them[193].

<Internals\\Interview Transcript\\ FGD-K(1-6)-02-20/0204> - § 1 reference coded [1.14% Coverage]

Reference: Unviability of medicine in the catchment area

Sometimes they won't get the medicines at that time they will approach the hospital[194].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20/0314> - § 4 references coded [2.47% Coverage]

Reference: Doctor's visit

We approached the hospital. Sometimes doctors will come here to treat us[195].

[192] Informant No **\\ ** IDI-C-01-20\0315 has responded during the IDI among the Cholanaickan community.
[193] Informant No **\\ ** IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[194] Informant No **\\ ** FGD-K(1-6)-02-20\0204 has responded during the FGD among the Kattunaickan community.
[195] Informant No **\\ ** FGD-C(1-4)-01-20\0314 has responded during the FGD among the Chaolanaickan community.

Reference: Natural hazard causing unavailability of medicine

Flood has destroyed most of the medicines. That's why we are going to the hospital nowadays[196].

<Internals\\Interview Transcript\\ IDI-P-01-20/0111> - § 1 reference coded [2.69% Coverage]

Reference: Serious disease

I know TB's medicine. But we can't get the medicine here. The plant can be seen in the deep forest. The people of this generation don't know about our medicines. It doesn't suit them. When they have an illness they go to hospital nowadays[197].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20/0112> - § 3 references coded [2.80% Coverage]

Reference: Epidemic

Yes, we are suffered from stomach pain, diarrhoea, fever, vomiting, and cough. we went to the camp for tablets[198].

Reference: Pregnancy

Nowadays we mainly go for delivery. Other diseases are we treat ourselves[199].

[196] Informant No \\ \\ FGD-C(1-4)-01-20\0314 has responded during the FGD among the Chaolanaickan community

[197] Informant No \\ \\ IDI-P-01-20\0111 has responded during the IDI among the Paniyan community.

[198] Informant No \\ \\ FGD-K(1-5)-01-20\0112 has responded during the GFD among the Kattunaickan community.

[199] Informant No \\ \\ FGD-K(1-5)-01-20\0112 has responded during the GFD among the Kattunaickan community.

Reference: Unviability of medicine

We are not preserving medicinal plants. If we didn't get plants but we need treatment, will go to the hospital[200].

<Internals\\Interview Transcript\\ IDI-K-01-19/1230> - § 2 references coded [0.93% Coverage]

If we get a knife wound with rusted iron, we go to the hospital these days[201].

Reference: Serious diseases

If they are not in a serious condition we will treat them otherwise if it is a serious case, will take them to the hospital[202].

<Internals\\Interview Transcript\\ IDI-C-02-20/0316> - § 14 references coded [7.28% Coverage]

References: Accessibility to hospital

we don't have medicine for skin diseases. we will approach the hospital[203].

Reference: Accessibility to hospital

Nowadays we will go to the hospital[204].

[200] Informant No \\ \\ FGD-K(1-5)-01-20\0112 has responded during the GFD among the Kattunaickan community.
[201] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[202] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[203] Informant No \\ \\ IDI-C-02-20\0316 has responded during the IDI among the Cholanaickan community.
[204] Informant No \\ \\ IDI-C-02-20\0316 has responded during the IDI among the Cholanaickan community.

<Internals\\Interview Transcript\\ IDI-K-05-20/0313 > - § 1

reference coded [0.30% Coverage]

Reference: Traditional medicine fails to cure

I won't go. Maybe it doesn't cure by our medicine then I will go to the hospital[205].

It is also crucial to highlight that STCs' shift from traditional to western treatment is not permanent. They alternate between using western medicine and using traditional medicine. According to STCs, if western medicine fails to cure a disease\illness or the patient does not receive adequate answers to their questions, they return to their own healing system. Here are a few examples from STCs in which they described circumstances in which a patient returns to and performs their own healing techniques.

<Internals\\Interview Transcript\\IDI-K-01-19/1230> - § 2

references coded [1.66% Coverage]

If the problem doesn't cure with ayurvedic medicine and English medicines we took them to the temple[206].

We go to the hospital. Thereafter no results, we go to the temple and pray[207].

<Internals\\Interview Transcript\\ IDI-K-02-19/1230> - § 1

reference coded [0.37% Coverage]

[205] Informant No \\ \\ IDI-K-05-20\0313 has responded during the IDI among the Kattunaickan community.
[206] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.
[207] Informant No \\ \\ IDI-K-01-19\1230 has responded during the IDI among the Kattunaickan community.

We will go to the hospital and if it doesn't cure, then we will do some rituals[208].

3.9 The Ecology of Healing

As previously stated, all adults in STCs have some understanding of health and healing. Their medical and healing expertise is intertwined with their livelihood and cultural practices. The understanding of illness and healing characteristics suggests that the body is not the most important structure in explaining the illness episode. The research has observed that mending of the body is not the primary focus of spiritual and ritual healing among STCs. Instead, STCs strive to re-establish an individual's connection to culture and tradition, believing that illnesses and diseases are caused by transgressions of taboos or disturbances in cultural and traditional practices, and are an external manifestation of the wrath of the sacred world. In this sense, healing a sick person is aided by addressing the causation component through the restoration of a sacred relationship.

However, there is significant ambiguity regarding the social and emotional aspects of serious ailments and the healing process. For example, on the one hand, sicknesses among STCs include bodily experiences of aliment such as injuries, wounds, bone fractures, changes in body temperature, and so on, which are all linked to production (one of the prime indicators concepts of the health of STCs). The healing process, on the other hand, attempts to restore the person to their living context and anticipate the desired functioning by re-establishing a relationship with external and supernatural actors. In other words, despite the bodily sensation of disease, the cause of illness and the healing process are attributed to external agencies rather than internal activities. The explanation above shows that STC's healing process has two dimensions: individual healing and collective healing. Individual healing encompasses personal health and mending the mind and body through physical, spiritual and emotional healing, whereas collective healing encompasses individual and cultural well-being.

From the preceding discussion, it is also evident that STCs' health management provides a comprehensive framework for maintaining social order as well as physical,

[208] Informant No \\ \\ IDI-K-02-19\1230has responded during the IDI among the Kattunaickan community.

spiritual, and cultural well-being. As a result, STCs devote a significant amount of time and effort to maintaining their health or preventing and safeguarding themselves from future disasters. STCs are primarily concerned with avoiding misfortunes, and this concern extends to subsistence, social, and cultural practices. The rationales for the prevention of diseases and illnesses include spiritual and moral components, as well as ecology, worldview, and belief system, all of which are intertwined into meaningful rituals. It is also important to note here that the rituals create a space to experience and express emotion freely, suspend the redundant decision-making processes, reduce anxiety, alleviate emotion, built a relationship between community members, and provide a space for non-verbal communication. In other words, ritual restores an individual into the life context and acknowledges its functioning behaviour.

Other than rituals it has been also observed that STCs' social network and interdependence of group and kin members play a crucial part in healing and sharing the therapeutic outcome, despite their socially flexible relationship. It is because co-members are involved at every stage of the process, from the aetiology of the illness through diagnosis and treatment and owing to the treatment's outcome. As a result, it is reasonable to conclude that STCs' healing practice has practical dimensions, with expectations firmly defined by the behavioural condition of illnesses and wellbeing.

The researcher has constructed two conceptual frameworks to understand STC's therapeutic practices: the Recursive Model and the Idiosyncratic Model. These models were created based on data analysis and observation of STCs' healing activities.

(A) **Recursive Model:** This model deals with the practical experience-based perception of health and diseases\illness. Whereas, the philosophy of this model is founded on everyday experience and an encounter with ecology, plant, and non-human organisms. It adheres to native logic, has a built-in ethos and philosophy of life, employs experiential information deposited in the cultural cloud, includes family or an immediate small group, and involves a self-healing or self-medicating process. This model reflects the healing of diseases as a public affair and comprises both the natural and supernatural intervention at both ends (i.e. for the perception of diseases\illness or the construction of a healing mechanism).

(B) **Idiosyncratic Model:** Under this model, a more severe, unfamiliar, concealed, and life-threatening kind of disease\illness has been characterized. This model explores casual references for the diseases\illness in nature and cultural belief systems. It consists of environmental factors and the advent of supernatural beings into the life dimensions of people, for example, ancestral curses, actions of spirits, and negative actions. In this model, the caregiver's scope is not limited to the experiential knowledge of the individual, immediate group, or co-family members, but it includes the expertise of professional healers from distant group members. Along with the healing modes of the 'recursive model,' it also includes the elaborated rituals, venerations, invocations, and sacrifices in the healing process. The logical and empirical explanation in this model of health problems and healing methods incorporate historical, spiritual, and personal reasoning and agencies outside the group.

3.10 Conclusion

To summarise, it is clear from the above case studies that the STCs approach to health and healing is coded into household practices, culturally modelled beliefs, worldviews and the knowledge system are entrenched in historical context, deposited in the environmental context and encompasses both the empirical and unempirical domains. Moreover, the worldview, religious background, cultural belief and cognitive mechanism are an essential part of both the perception of health and the healing mechanism. Their method of healing comprises reasoning and logic derived from daily experience and practices in which individual behaviour is cyclic and non-reflective. Whereas the rituals and mantras elicit transpersonal experiences and integrate an individual's altered state of consciousness with social identity and culture.

CHAPTER 4: HEALING KNOWLEDGE MANAGEMENT

4.1 Introduction

According to the descriptions in the preceding chapters, STCs' healing knowledge is complex, formed and practised through generations, rooted in their cultural experiences and worldview, and comprises the knowledge that can be classified as explicit, implicit, and tacit. For reference, the knowledge that can be expressed verbally by the knower is referred to as explicit knowledge, whereas putting explicit knowledge to use practically is known as implicit knowledge (Davies, 2013). However, tacit knowledge includes a wide range of phenomena, such as the capacity to recognise something despite the inability to describe it in terms that are context-independent; in other words, tacit knowledge cannot be expressed in the language without the use of context-dependent or demonstrative elements, but it can nonetheless be shared and communicated (Davies, 2013). The mechanism of transmission is not verbalization and documentation, but rather experience and imitation. In a nutshell, STCs' healing practice is a network of knowledge, worldviews, beliefs, and traditions that are passed down formally and informally among kin groups and communities through social encounters, oral traditions, ritual practices, and different activities so as to preserve, communicate, and contextualise autochthonic relationships of a human being with culture and landscape over time.

However, in order to completely appreciate and comprehend STCs' therapeutic practices, it is necessary to consider how STCs acquire, develop, share, protect, and successfully manage the knowledge system in order to fulfil present and growing requirements. This chapter is conceptualised to cover STCs' knowledge management systems, as well as the roles and responsibilities of stakeholders involved in the management process. This chapter will also discuss some of the issues that STCs experience in the management of healing knowledge.

The chapter opens with an explanation of STC's healing knowledge's general characteristics. Following that, it goes into detail on the steps of STCs' knowledge management process, which includes knowledge acquisition, development, storage, and transmission process. The chapter also addresses the roles, responsibilities, and attitudes

of various stakeholders participating in or responsible for managing their healing knowledge system. The primary goal of this chapter is to investigate how STCs use knowledge management and the challenges in effectively managing healing knowledge.

4.2 Characteristics of STCs' Healing Knowledge

According to the descriptions in the preceding chapters, STCs therapeutic practices originate from the dynamic interplay of the complexities of variables such as context, practice, worldviews and belief. Here, context denotes learning as a result of history, demography, and biophysical elements of ecology; practices denote meaningful action as a result of physical and experiential learning, and belief denotes the influence that spirituality and value have on how individuals act within their ecosystem. Therefore, it is critical to obtain a comprehensive understanding of the characteristics of STCs healing knowledge because it is tied to the nature of individuals and communities, organizational structure (such as kin), nature and ecology (e.g. herbal and other remedies) as well as their underlying socio-cultural value systems.

As delineated in Chapters 1 and 3, STCs' healing knowledge is generated from a diverse epistemic foundation that incorporates knowledge of the human, sacred, and physical realms. It has been also mentioned that their therapeutic knowledge is non-codified (i.e. practised orally), transpersonal, sustainable, and known to all adult members of the communities in the form of collective knowledge. It is not only used to cure patients, but it has also become a way of life for STC members since it is embedded in the idea of community and stored harmony between humans and the environment. It has also been stated that STCs' healing knowledge consists of lived, experiential, and performed knowledge that is produced locally and engrained in practices, institutions, relationships, and rituals. To put it another way, STC's healing practices are complementary to community knowledge that is explicit in their cognitive processes, despite the fact that they are basically tacit. In the descriptions of chapter 3, it has been also highlighted that in many cases an individual acquires this knowledge in a particular context through experience. They usually maintain complete secrecy in sharing knowledge with others unless another individual has experience of STCs, in which case they exchange knowledge.

STCs held their healing knowledge in the form of visuals beyond nomenclature, as data suggests, especially in the case of herbal medicine and minerals. In other words, their therapeutic knowledge is a non-linguistic, highly personal, and context-specific knowledge that is deeply rooted in individual action, native logic, belief, and worldview. STCs, for example, rarely know the name of the herbal medicine; instead, they identify it in the context of the environment based on its growing location and other associated qualities such as the form, colour, taste and size of medicinal plants. The following are some excerpts from STCs' IDIs and FGDs in which informants mentioned the above-described knowledge system characteristics.

<Internals\\Interview Transcript\\DI-K-03-20/0115> - § 4 references coded [5.16% Coverage]

Reference: Based on Context

There is a small plant which grows on trees. We take them and heat them. Then we squeeze and extract the oil and put it inside the ears. It will cure all the pains in the ears[209].

It doesn't have any names, by walking 5km from here we can see so many medicines[210].

There is a special leaf in the forest and we boil it in water and take bath, it can reduce diseases easily[211].

Researcher: Again you don't know the name of it?

No. But we can easily recognise the plant even though we don't know its name[212].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20/0314> - § 5 references coded [4.64% Coverage]

[209] Informant no. DI-K-03-20/0115 has responded during the IDI among the Kattunaickan community.
[210] Informant no. DI-K-03-20/0115 has responded during the IDI among the Kattunaickan community.
[211] Informant no. DI-K-03-20/0115 has responded during the IDI among the Kattunaickan community.
[212] Informant no. DI-K-03-20/0115 has responded during the IDI among the Kattunaickan community.

Reference: Based on the number of leaves and their shape

We have medicines in the forest. We crush and apply the plant leaf. We can find out by seeing their leaves. The plant has three petal leaves[213].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20/0112> - § 4 references coded [6.69% Coverage]

Person 3: Our forefathers didn't tell the name of some medicines. They show medicines but did not tell the medicine's names. There is no need to know their names for them because they can identify each medicinal plant[214].

Reference: Based on Context of Growing Place

Person 5: I don't know the name. It grows near the river. He had a bone fracture and applied that paste[215].

Reference: Based on Colour

Person 5: Yellow, black, red, light green, and dark blue. Murivooty is in red, Padakizhangu in black, Dried Nannari is in black and Dantha pala (Wrightia tinctoria) is used for dandruff and skin diseases also. When we boil it with oil it turns into a dark blue colour. A creeper is used for bone fracture, when we grind it, it turns into yellow colour[216].

<Internals\\Interview Transcript\\ IDI-K-02-20/0114 > - § 2 references coded [1.34% Coverage]

Reference: Visual Memory

[213] Informant no. FGD-C(1-4)-01-20/0314 has responded during the FGD among the Cholanaickan community.
[214] Informant no. FGD-K(1-5)-01-20/0112 has responded during the FGD among the Kattunaickan community.
[215] Informant no. FGD-K (1-5)-01-20/0112 has responded during the FGD among the Kattunaickan community.
[216] Informant no. FGD-K (1-5)-01-20/0112 has responded during the FGD among the Kattunaickan community

I don't know the name. But I can identify them when I see them[217].

<Internals\\Interview Transcript\\ IDI-K-01-19/1230> - § 2 references coded [1.12% Coverage]

Manchan: We started learning on the 21. But we don't know all the plants' names[218].

<Internals\\Interview Transcript\\ IDI-C-01-20/0315> - § 2 references coded [2.70% Coverage]

Balan: " Chirappullu "(a kind of grass) is used for migraine. I don't know all the medicine's names. But I can understand their uses. Our forefathers show us the medicines they didn't tell us some of the medicine's names. I do treatment for Asthma but I don't know the name of the medicine[219].

It has also been observed that the risk of knowledge loss is quite significant in the event of the custodian's death or a change in culture or tradition because the knowledge is held in the custodian's mind and is dependent on context, tradition, and culture (as discussed above). But before diving into the debate over what the dangers are and how to maintain knowledge continuity through good knowledge management, it is critical to find answers to the following questions. How does a person learn about healing among STCs? What are the sources? If the knowledge isn't codified, where do they preserve it? How do they pass on their knowledge to the next generation? Answers to these questions are crucial for understanding the STC's healing knowledge management and making policy recommendations for the conservation and maintenance of knowledge systems for future generations.

[217] Informant no. IDI-K-02-20/0114 has responded during the IDI among the Kattunaickan community.
[218] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community.
[219] Informant no. IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community.

4.3 The Process Knowledge Management

Knowledge management, according to Raub and Romhardt (1999), entails the processes of knowledge identification, knowledge acquisition, knowledge development, knowledge sharing and distribution, knowledge utilisation, and knowledge retention (Probst, Raub, & Romhardt, 1999). The processes outlined above are only applicable if the knowledge will be managed by people who do not belong to the community of knowledge practitioners (i.e. outsiders). To put it another way, in this process of knowledge management, the outsider defines what knowledge is and which types of knowledge should be retained in this knowledge management process. In that regard, STCs' therapeutic knowledge management process is fundamentally different. As data suggests, STCs' healing knowledge management steps include knowledge acquisition, knowledge storage, knowledge sharing, knowledge utilization, knowledge acknowledgement and knowledge transfer. However, the STCs model of knowledge management is comparable to Nonaka and Takeuchi's (1995) SECI model, which postulated four stages of knowledge creation and conversion, namely socialization, externalisation, combination, and internalisation (SECI) (Nonaka & Takeuchi, 1995). The SECI model describes the process of developing knowledge by transforming tacit knowledge into explicit knowledge. But before getting into the specifics of knowledge management models, it is critical to understand the basic process involved in STCs' knowledge management.

4.3.1 The Process of Knowledge Acquisition

How does a person from STCs learn about healing? and What are the sources? STCs therapeutic knowledge acquisition is a complex process in which an individual learns from experience within his subsistence practice or through imitation and observation. Their source of knowledge, however, is a family, peer group, kin members, a spiritual or supernatural power, and, finally, the pursuit of self-treatment, followed by the mastery of the healing arts (as data suggest). In other words, STCs generate therapeutic knowledge by logical deduction and practical experience in the relevant setting. As previously stated, STCs therapeutic knowledge is subjective (because it is acquired through cognitive experiential learning) and incorporates tacit abilities and information, making it difficult to formalise and express.

The analysis of data also shows that observation, imitation and practice are the three fundamental processes to acquiring healing knowledge, however, the individual's personal preference, interest, subsistence or socio-economic practices and a real-life situation has an important role in the STCs healing knowledge acquisition. Individuals in STCs begin learning about herbal medicine and other therapeutic remedies at a very young age (in fact, in childhood) while assisting their family members in subsistence activities. The family is a valuable source of information. Children of STCs learn about healing from their parents and grandparents. According to the data, children learn healing from their father or grandfather in the majority of cases; nevertheless, some of them also indicated that they learned healing from their mother or grandmother. As stated in chapter 3, all adult members (male and female) have knowledge of medicine, and male members have knowledge of medicinal plants, while female members have expertise in home remedies; thus, mentioning father and grandfather as a source of knowledge does not imply that female does not know about medicine; on the other hand, it demonstrates that children begin going with their father for subsistence practise at a young age and begin learning. The knowledge acquisition from family is based on observation, demonstration, and supervised learning. Apart from that STCs also acquire knowledge from non-parental family members or elders such as uncles, in-laws, brothers etc. It is important to note here that all STCs have more or less anomalous processes of knowledge acquisition and they not only acquire healing knowledge from the members of the colony but also from kin members of their community and sometimes from the members of other communities. For example, here are a few extracts from IDIs and FGDs of SCTs, in which informants have mentioned the above-mentioned knowledge acquisition process.

<Internals\\Interview Transcript\\ IDI-C-01-20/0315 > - § 1 reference coded [0.27% Coverage]

Reference: Parents

Researcher: Who taught you about the medicines?

Informant: My parents taught me[220].

[220] Informant no. IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community.

<Internals\\Interview Transcript\\ IDI-K-06-20/0121 > - § 2 references coded [1.35% Coverage]

Reference: Family members

It is hereditary knowledge. I got this medicinal knowledge from my ancestors[221].

<Internals\\Interview Transcript\\ IDI-K-03-20/0115 > - § 2 references coded [1.92% Coverage]

Reference: Father based on observation

I watched and learn gradually from my father. It's a part of our life. And society people asked us for some medicinal plants but we don't know the purpose. Those medicines are being used by kottakkal arya vydhyashala[222].

<Internals\\Interview Transcript\\ IDI-P-01-20/0111 > - § 1 reference coded [2.05% Coverage]

Reference: Grandparents and other elders from different settlements

Grandparents, Bommanhe (he is from Kumbalapara) and his sons valiya Bomman, cheriya Bomman, velutha, chadayan and mathan taught me. My mother is from Adyampara[223].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20/0112> - § 3 references coded [2.16% Coverage]

Reference: Parents and Grandparents

[221] Informant no. IDI-K-06-20/0121 has responded during the IDI among the Kattunaickan community.
[222] Informant no. IDI-K-03-20/0115 has responded during the IDI among the Kattunaickan community
[223] Informant no. IDI-P-01-20/0111 has responded during the IDI among the Paniyan community.

We got this information from our parents and grandparents. They taught us the uses of the plant and a large number of edible medicinal plants used for healing practices[224].

<Internals\\Interview Transcript\\ IDI-K-01-19/1230> - § 3 references coded [3.48% Coverage]

Reference: Grandparents

Our grandparents taught me. They showed us the plants when we go through the forest and taught us the uses of the plants[225].

<Internals\\Interview Transcript\\ IDI-K-05-20/0313> - § 1 reference coded [1.32% Coverage]

Reference: Uncle

We don't say it is because of ego. My uncle knew medicines and has medicinal knowledge. He got his knowledge from his forefathers. He only taught me. If somebody wants to know some medicines and ask him then he will share some medicinal knowledge. New generation people don't have the interest to learn these things[226].

<Internals\\Interview Transcript\\ IDI-A-01-20/0101> - § 1 reference coded [1.04% Coverage]

Reference: Grandmother

[224] Informant no. FGD-K (1-5)-01-20/0112 has responded during the FGD among the Kattunaickan community.
[225] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community.
[226] Informant no. IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community.

I got medicinal knowledge from my grandmother. I only use the medicines which have been used by my forefathers. I have not encountered any new medicine[227].

It is important to note here that STCs knowledge acquisition is not limited to family and non-parental elders but extended to the peer group and friends. Peers are one of the significant sources of knowledge among STCs. Peer group knowledge acquisition is an activity-oriented and situation-based learning process that occurs through imitation and observation during daily activities or people's encounters with such situations. Social networks and interpersonal relationships play a significant part in this knowledge acquisition process because they promote knowledge exchange, sharing, and trade. In the following extracts from IDIs and FGDs, for example, an informant recounts how they acquired medicinal knowledge from acquaintances, peers, and personal encounters with circumstances requiring rapid medical assistance.

<Internals\\Interview Transcript\\IDI-C-01-20/0315> - § 1 reference coded [1.98% Coverage]

All people do not understand all the medicines. We go with a group of people and it is very rare to go alone[228].

<Internals\\Interview Transcript\\IDI-K-02-20/0114> - § 1 reference coded [1.30% Coverage]

I know the medicinal plants that I'm collecting. When we go for collecting medicines and somebody doesn't know some medicinal plant's name, at that time we will teach him and share our knowledge with him[229].

<Internals\\Interview Transcript\\IDI-K-05-20/0313> - § 1 reference coded [1.30% Coverage]

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[227] Informant no. IDI-A-01-20/0101 has responded during the IDI among the Aranadan community.
[228] Informant no. IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community
[229] Informant no. IDI-K-02-20/0114 has responded during the IDI among the Kattunaickan community

I used to go with Chadayan, Gopalan and chembra babu for collecting medicines. When I was in Mancheri, I got medicinal knowledge from there (Mancheri colony, Chodanupetti, where my wife's parents were living). I used to go with them to collect medicines[230].

STCs also gain healing knowledge from spiritual and supernatural callings, in addition to family and peers. As described in chapter three, they acquire healing knowledge by revelation, insights, or direct interaction with the spirits, god, or ancestors' beings when in the dream state, under possession, or in a trance condition. This way of acquiring knowledge is not known to all community members. The source of this method of knowledge acquisition is exclusively available to a few eligible members of the community who are spiritually highly qualified. As a result, STCs healing knowledge is exceptionally subjective, tacit, and personal. For example, kindly visit section 4.3.2 of chapter three.

4.3.2 STCs Healing Knowledge Development and Storage System

It is extensively discussed in the preceding sections that SCTs obtain their healing knowledge from a variety of sources, including family and non-parental elders, peer groups, and activity-oriented and situation-based learning processes that occur through imitation and observation during daily activities or people's encounters with such situations. However, it is crucial to examine whether their knowledge is confined to their sources' information or whether they offer new knowledge to the knowledge system. If they introduced new knowledge into the system, what is its nature and where did it come from? What medium and approach are STCs using to store therapeutic knowledge?

To comprehend the process of adding new knowledge to STCs' healing knowledge repository, it is necessary to first comprehend the intrinsic relationship between diseases and healing practice inside STCs' healing model. As mentioned in Chapters 1 and 3, STCs have a specified aetiology and sense of health and diseases and they perceive health via that; thus, freshly generated diseases have no reference in their perception of health concerns. It limits the potential of discoveries or the acquisition of new

[230] Informant no. IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community

knowledge because the source of diseases and their treatment approaches are predefined and predetermined in their model of health STCs, for example, do not include vitamin deficiency-related night blindness or skin illnesses in their model as a problem, despite the fact that they are affected by these issues on both a biological and socioeconomic level. This is a complex phenomenon of the STCs' health model that has been thoroughly described in the following chapter. However, the pursuit of new information is not entirely absent among STCs. It has been documented that few practitioners of healing knowledge are active in experimentation with ancient and new medicine to discover new understandings about medicinal plants. For example, Informant no. IDI-K-01-19/1230 has reported identifying new medicinal plants or conducting an experiment on a specific medicinal plant for a specific disease; however, it is important to note that the nature of the experiment included the mixing of two or more medicines in a specific quantity based on their practical experience and knowledge of medicinal plants. It is also worth noting that a few incidents have been documented in which informants have reported discovering or identifying new knowledge but are hesitant to use it for treatment because they limit their treatment to their ancestors' method of treatment and are unsure whether the newly discovered medicine was used by their ancestors or not.

<Internals\\Interview Transcript\\ IDI-K-01-19/1230> - § 1 reference coded [2.27% Coverage]

Reference: Confusion in using a new medicine

We found out about new plants but we are confused if it was used by our grandfathers or not. So we are not using new plants for treatment. If we got wound or cut marks, take medicine from the forest then wash the wounded area with hot water and use the paste of leaves, apply on the wound and after two days it will cure. If we get a knife wound with rusted iron, we go to the hospital these days. We have faith in some medicinal plants so we use those plants otherwise we will approach hospitals[231].

[231] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community

<Internals\\Interview Transcript\\ IDI-K-05-20/0313> - § 1 reference coded [0.58% Coverage]

Reference: Use of known medicine

Ravi: We did not find out new medicinal plants. We can identify medicinal plants that we already have known[232].

<Internals\\Interview Transcript\\ FGD-K(1-5)-01-20/0112> - § 1 reference coded [0.77% Coverage]

Reference: No intentions to find new knowledge

Not yet. We are not going to search for a new plant. Sometimes plants get destroyed. So it leads to the unavailability that plants till the rainy season[233].

<Internals\\Interview Transcript\\ IDI-K-03-20/0115> - § 4 references coded [5.12% Coverage]

Reference: Not knowing about the available medicine but willing to help the health department in finding new medicine

NO.. no.. because actually we don't know the quality of new medicines in the forest, but we are ready to help of health department if someone wants to test within the lab and identify which medicine can be used for which disease, after that we ready to collect those items also. There are lots of medicine here but we are not aware of that. My grandparents know a variety of medicines here. Our generation doesn't know that much[234].

<Internals\\Interview Transcript\\ IDI-C-01-20/0315> - § 1 reference coded [0.42% Coverage]

[232] Informant no. IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community
[233] Informant no. FGD-K (1-5)-01-20/0112 has responded during the FGD among the Kattunaickan community
[234] Informant no. IDI-K-03-20/0115 has responded during the IDI among the Kattunaickan community

Reference: Following their forefathers' medicine

We didn't find new medicines for new diseases. We are following the medicines used by our ancestors[235].

<Internals\\Interview Transcript\\ IDI-C-01-20/0315> - § 2 references coded [2.94% Coverage]

Reference: Experiments in medicine

some people trying to find new medicines like Mohanan. He is doing some experiments. ...."Valliyamma" was a lady healer who used to treat cancer also. His son Rajesh is doing healing practices. His practices are different as compared to his mother's. His medicines for treatment are much better than his mother's. It is because of his experiments in medicines[236].

It is also worth noting that one of the STCs' subsistence practices is the collection of medicinal plants for Ayurvedic doctors, which could be a significant source of new information and value addition for STCs' therapeutic practice. However, STCs' rigid policy of adhering to their conventional therapeutic approach prevents them from expanding their knowledge system. Nevertheless, a few informants have reported a lack of trust and communication between community members and doctors also limits the input of new knowledge into the system. In other words, the Ayurveda doctor does not educate community members on the usage of medicinal plants that they are instructed to collect from the forest. Members of the community pick medicinal plants and provide them to the person in charge of the assignment, in exchange for a small remuneration.

Apart from STCs' attitudes toward new information, their way of storing knowledge plays also an important role in knowledge management and knowledge development. As mentioned in earlier chapters, STCs were (and still are) foraging groups who used

[235] Informant no. IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community
[236] Informant no. IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community

to regulate their production-consumption-distribution cycle through 'ecological storage,' 'practical storage,' and 'social storage' (Ingold, 1987). The organic creation of items in the natural context is implied by ecological storage, whereas practical storage includes the physical practice of laying things aside (Ingold, 1987). However, social storage entails the appropriation of materials in such a way that the rights to future distribution and use are chosen collaboratively (Ingold, 1987). The knowledge production-consumption-distribution cycle of STCs is also similar to that of their subsistence cycle. STCs, as the findings suggest, store knowledge in an ecological context, outside the mind and body, in the form of image and activity (such as growing area/place, colour, shape, and so on). For example, in most situations, STCs do not know the name of the medicine, but they can recognise the plant based on its shape, colour, leaf size, and so on. STCs do not collect and preserve medicine in advance, they collected medicine only when they need it. It is because they believe that medicine is stored in nature, and they can get it any time they need it. This practice of need-based and context-specific knowledge management is implied toward the ecological storage of the knowledge system. The following are some examples from IDIs and FGDs in which informants discuss how to locate therapeutic plants in an ecological environment for a certain condition.

<Internals\\Interview Transcript\\FGD-K(1-5)-01-20/0112> - § 1 reference coded [1.42% Coverage]

Reference: Not preserving medicine in advance

Person 3: we are not preserving medicine. When we need medicine we will prepare and consume it at the same time[237].

<Internals\\Interview Transcript\\ DI-C-01-20/0315 > - § 2 references coded [2.70% Coverage]

Reference: Knowledge beyond nomenclature

[237] Informant no. FGD-K(1-5)-01-20/0112 has responded during the FGD among the Kattunaickan community

"Chirappullu "(a kind of grass)is used for migraine. I don't know all the medicine's names. But I can understand their uses. Our forefathers show us the medicines they didn't tell us some of the medicine's names. I used to do treatment for Asthma but I don't know the name of the medicine[238].

<Internals\\Interview Transcript\\ IDI-K-01-19/1230 > - § 2 references coded [1.43% Coverage]

Reference: Not preserving medicine in advance and ecological storage

....they don't preserve medicines. They make it whenever they want. They only keep medicinal plants for outsiders. If plants will collect today, sell them the next day[239].

<Internals\\Interview Transcript\\ IDI-K-03-20/0115 > - § 4 references coded [5.16% Coverage]

Reference: Not preserving medicine in advance and ecological storage

There is a small plant which grows on trees. we took them and heat them. Then we squeeze and take the oil and put it inside the ears. It will remove all the pains in the ears. It does not have any names, By walking 5km from here we can see so many medicines[240].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20/0314 > - § 5 references coded [4.64% Coverage]

Reference: Identification of medicinal plant in environmental context based on its growing place

[238] Informant no. IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community
[239] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community
[240] Informant no. IDI-K-03-20/0115 has responded during the IDI among the Kattunaickan community

Person 2 We have medicines in the forest. That plant is used to crush and apply. Which we can't see here. It can be seen among rocks on the hill. I can find out by seeing their leaves. The plant has three petal leaves[241].

Reference Knowledge beyond nomenclature

Person 2: Our forefathers didn't tell the name of some medicines.

Person 4: They show medicines but don't tell the medicine's name. There is no need to know their names because I can identify each medicinal plant[242].

<Internals\\Interview Transcript\\FGD-K(1-5)-01-20/0112 > - § 4 references coded [6.69% Coverage]

Reference: Ecological storage and Knowledge beyond nomenclature

Person 5: When you get injuries from the forest which medicines do you use for it?

Devan: The medicinal plants are easily available for us too. it is a small herb.it will squeeze and apply to the injured area. I don't know the name. It grows near the river. He had a bone fracture and applied that paste. I jumped over the bark of the " Maruthi" tree (Terminalia Arjuna) and one of the barks got pierced into my skin, and then my brother cut it and removed himself[243].

Reference: Identification of medicinal plants based on their colour and shape

[241] Informant no. FGD-C (1-4)-01-20/0314 has responded during the FGD among the Cholanaickan community
[242] Informant no. FGD-C (1-4)-01-20/0314 has responded during the FGD among the Cholanaickan community
[243] Informant no. FGD-K (1-5)-01-20/0112 has responded during the FGD among the Kattunaickan community

Yellow, black, red, light green, and dark blue. Murivooty is in red colour, Padakizhangu in black, Dried Nannari is in black and Diantha pala (Wrightia tinctoria) is used for dandruff and skin diseases also. When it boils with oil it turns into a dark blue colour. The grass is used to boil with oil it will turn red. A creeper is used for bone fracture, when it grinds it turns into yellow colour[244].

<Internals\\Interview Transcript\\ IDI-K-02-20/0114 > - § 2 references coded [1.34% Coverage]

Reference: Ecological storage and Knowledge beyond nomenclature

I don't know the name. But I can identify them when I see them[245].

The aforementioned example also shows that STCs employ social storage systems in addition to ecological storage systems to collaboratively decide which medicines are suited for specific ailments as well as how to gather and from where. This supports the adoption of a sustainable lifestyle by members of the indigenous society, suspends the complexity of the decision-making process, and the risk of over-exploitation of a certain medicine to treat a specific illness. This kind of knowledge management creates an eco-cultural cloud as a repository for social learning and collective intelligence for the transmission of information to the next generation.

However, the information has been managed by the rule of secrecy and sacredness in order to protect (both in terms of purity and misuse) knowledge and claim ownership over it. It is important to note that STCs not only maintain secrecy in terms of sharing knowledge with outsiders but in a few cesses (as reported by the informants) they also maintain secrecy from their fellow community members. Here are a few extracts, as an example, in which informants have directly or indirectly indicated the act of secrecy in knowledge sharing.

[244] Informant no. FGD-K (1-5)-01-20/0112 has responded during the FGD among the Kattunaickan community
[245] Informant no. IDI-K-02-20/0114 has responded during the IDI among the Kattunaickan community

<Internals\\Interview Transcript\\ IDI-K-05-20/0313> - § 2 references coded [3.11% Coverage]

Reference: Act of secrecy in knowledge sharing due to the assumption that revealing the name of medicine may reduce its medical value.

Reference: Concealing information from their child

Our ancestors won't tell others about medicines to others until their death. They won't pass their knowledge to other people even their children too. We believe if we say to others the power of medicine will decrease[246].

Reference: Act of secrecy in knowledge sharing

There are no religious beliefs associated with the medicinal collection. If anybody has medicinal knowledge he won't share his knowledge with others. If you want any medicine for diseases the person who knows about medicines doesn't show it to you. He will give medicines and tell you how to apply or how to intake medicines[247].

<Internals\\Interview Transcript\\ IDI-K-01-19/1230 > - § 6 references coded [4.14% Coverage]

Reference: Act of secrecy in knowledge sharing

We are using separate medicine for snake bites. Keerikizhangu is used for snake bites. But won't show it to others[248].

Reference: Concealing information from their brother and family members

[246] Informant no. IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community
[247] Informant no. IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community
[248] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community

Person 2: we are cousins brothers. When I encountered with snake (name of the snake-churutta) bite he gave me medicine and I applied over it and cured it. But he didn't tell which medicine was used for it[249].

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20/0314 > - § 1 reference coded [0.77% Coverage]

Reference: Act of secrecy in knowledge sharing

We collect medicines from the deep forest for Jaundice. we have medicine. It is a secret. we are not revealing[250].

It's also worth noting that the secrecy in STC's healing practice extends not just to sharing healing information with family members, peer groups, or other community members, but also to patients. They believe that keeping the illness (especially complicated illnesses) and details of healing confidential from the patient protects the patient from severe psychological effects and keeps their mind at ease so that they can eat and drink properly because most indigenous medicines are taken orally. In other words, STCs maintain secrecy from both the public and the patient. In addition, indigenous communities, like STCs, lack the legal protections necessary to protect their knowledge, such as a specific intellectual property right dedicated to indigenous knowledge, particularly community knowledge, and they are also not included in the processes that decide how their knowledge and other practices are to be used. This is one of the reasons why knowledge is kept secret, according to scholars (Kwame, 2016).

4.3.3 STCs healing knowledge transmissions

It is discussed in the previous chapters and above sections that STCs healing knowledge involves context (bio-physical features and history), practice (meaningful action, through physical interaction and experiential) and belief (spirituality and revelations). It is important to note here that the elements of belief that make STCs healing

[249] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community
[250] Informant no. FGD-C(1-4)-01-20/0314 has responded during the FGDs among the Cholanaickan community

knowledge an emergent occurrence, but the understanding component of STCs healing knowledge, such as knowledge of herbal medicine, skills (message) etc., is just as significant. Additionally, as was previously discussed in detail, STCs' healing knowledge is a combination of explicit, implicit, and tacit forms and is retained in the form of abilities, ingrained routines, beliefs, and mental models, such as the "metaphorical mental model" (citation), in which a concept based on the conception of environment serves as the foundation for action in daily life. The mental model is intended to engage people within the ecosystem rather than be used to perceive the reality of outsiders, which is equally crucial to emphasise in this context. In other words, STCs' healing knowledge is retained in the environmental context beyond nomenclature in the form of visuals and is only accessible to members of the community. They keep the knowledge secret in order to safeguard it from misuse and claim ownership.

As was previously noted, STCs learn by imitation, observation, and other social learning techniques that are woven into everyday activities from an early age. There are three knowledge transfer channels studied among STCs.

a. **Vertical Channel:** Vertical transmission is a mode of knowledge transfer in which information is passed down from parents and grandparents to offspring (Cavalli-Sforza , Feldman , Chen, & Dornbusch , 1982) (McElreath & Strimling , 2008). The examples from STCs' IDIs and FGDs below demonstrate how knowledge is shared vertically among them.

<Internals\\Interview Transcript\\ IDI-K-03-20/1501> - § 2 references coded [1.92% Coverage]

I watched and learn from my father. I saw my father taking those plants for medicinal purposes. By seeing those I learned some variety of plants have the individual quality to heal some sort of health issues[251].

<Internals\\Interview Transcript\\ FGD-K-01-20/0112> - § 3 references coded [2.16% Coverage]

Person 3: We learned this from our parents and grandparents. They taught us how to use the plant and a variety of edible medicinal plants used in healing practices. If we had a cough, we used a creeper called " Valli."[252].

<Internals\\Interview Transcript\ IDI-K-01-19/1230> - § 3 references coded [3.48% Coverage]

Person 1: we got this knowledge from our parents[253].

Person 2: Our grandparents taught them. When we went through the forest, they showed us the plants and taught us how to use them[254].

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b. **Horizontal Channel:** When information is shared between people of similar ages, it is known as horizontal transmission. (Cavalli-Sforza , Feldman , Chen, & Dornbusch , 1982) (McElreath & Strimling , 2008). The following illustrations from STCs' IDIs and FGDs show how knowledge is transferred horizontally among them.

<Internals\\Interview Transcript\\ IDI-C-01-20/0315> - § 1 reference coded [1.10% Coverage]

[251] Informant no. IDI-K-03-20/1501 has responded during the IDI among the Kattunaickan community
[252] Informant no. FGD-K-01-20/0112 has responded during the FGDs among the Kattunaickan community
[253] Informant no IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community
[254] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community

" Chirappullu "(a kind of grass)is used for migraine. I don't know all the medicine's names. But I can understand their uses. Our forefathers show us the medicines they didn't tell us some of the medicine's names. I used to do treatment for Asthma but I don't know the name of the medicine[255].

<Internals\\Interview Transcript\ IDI-K-02-20/0114> - § 1 reference coded [1.30% Coverage]

I know the medicinal plants that I'm collecting. When we go for collecting medicines and somebody doesn't know some medicinal plant's name, at that time we will teach him and share our knowledge with him[256].

<Internals\\Interview Transcript\ IDI-K-01-19/1230> - § 1 reference coded [0.54% Coverage]

They are going with a group of people to collect medicinal plants. They are aware of which plants to be collected[257].

<Internals\\Interview Transcript\\ IDI-K-05-20/0313> - § 1 reference coded [1.30% Coverage]

I used to go with Chadayan, Gopalan and chembra babu for collecting medicines. When I was in Mancheri I got medicinal knowledge from there (Mancheri colony, Chodanupetti) where my wife's parents were living. I used to go with them to collect medicines[258].

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[255] Informant no. IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community
[256] Informant no. IDI-K-02-20/0114 has responded during the IDI among the Kattunaickan community
[257] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community
[258] Informant no IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community

c. **Oblique Channel:** This is a method of knowledge transmission to younger generations by adults other than parents or grandparents (Cavalli-Sforza , Feldman , Chen, & Dornbusch , 1982) (McElreath & Strimling , 2008). For example,

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<Internals\\Interview Transcript\\ IDI-P-01-20/0111> - § 1 reference coded [2.05% Coverage]

My grandparents and Bomman, who is from Kumbalapara, taught me, along with his sons Valiya, Cheriya, Velutha, Chadayan, and Mathan. Adyampara is where my mom is from[259].

4.4 Challenges in healing knowledge Management

In the current context, there are several challenges in healing knowledge management among STCs because they are undergoing a rapid lifestyle transition. Given that STCs IKH consists of lived, experiential, and enacted knowledge, changes in lifestyle have a significant impact on knowledge management, preservation, and conservation. The following are a few challenges identified among STCs in knowledge management.

I. **Loss of interest in learning among the younger generation:** As mentioned previously, IKH involves consisting of a set of shared values, beliefs, worldviews, experiences, and practices. The younger generation people don't show interest in practices and mantras associated with healing practices because of the influence of modern technology and education. For example,

[259] Informant no IDI-P-01-20/0111 has responded during the IDI among the paniyan community

<Internals\\Interview Transcript\\ IDI-K-01-19/1230> - § 2 references coded [1.79% Coverage]

Some children like to learn but some of them are not interested to learn. Most of them know the medicinal plants but don't know mantras. We teach them but some of them are not interested to learn. So they can't do healing practices[260].

<Internals\\Interview Transcript\\IDI-K-05-20/0313 > - § 2 references coded [3.52% Coverage]

During early times people had been going to collect medicines but children of this generation don't know the medicine's name. They are not interested to learn and collect medicines[261].

II. **Rapid lifestyle change:** With the repaid change in lifestyle caused by modernisation, and technology, various cultures and practices associated with IKH are rapidly disappearing. Collective learning and contextual learning are examples of this. As previously stated, STCs store their knowledge in ecological contexts and there is no documentation of their knowledge. Much of the learning occurs during subsistence activity. STCS used to begin learning at a young age by observing and imitating their parents during subsistence activities. However, as subsistence strategies change, many STCs members opt for a different mode of subsistence, removing the opportunity for collective and contextual learning.

<Internals\\Interview Transcript\\ IDI-K-02-20/0114 > - § 1 reference coded [0.43% Coverage]

[260] Informant no. IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community
[261] Informant no IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community

..the new generation of people are not going with them for collecting medicine. They go for outside jobs[262].

III. **Poor recognition and reduction in use:** As previously stated, IKH is a type of tacit knowledge that is stored in people's minds and passed down from generation to generation orally, making it susceptible to change. Factors such as the development process, the reach of modern medicine, urbanisation, large-scale migration, and the displacement of STCs from their traditional land have made youth less receptive to IKH. Furthermore, the study discovered that IKH is considered outdated knowledge and lacks reorganisation from the government. For example, the curriculum of the formal education system did not include indigenous knowledge.

IV. **Limited knowledge exchange:** STCs maintain complete secrecy in the exchange of knowledge among community members and with outsiders, as discussed in detail in chapter 3, which impedes communication between community members and outsiders.

V. **Identification of knowledge holders is challenging:** It is challenging to identify knowledge holders because there is no structure in place to identify knowledge bearers and STCs share knowledge in secret.

VI. **The disappearance of culture and practices:** As previously mentioned, IKH consists of a set of shared values, beliefs, worldviews, experiences, and practices that are formed locally and ingrained in practices, institutions, relations, and rituals; as a result, changes in traditional culture brought on by modernization, technology, or displacement-driven development make them vulnerable to change and challenging to manage.

[262] Informant no. IDI-K-02-20/0114 has responded during the IDI among the Kattunaickan community

VII. **The disappearance of traditional medicine:** According to the informant, some of the native medicinal plants, seeds, and creepers in the catchment area have vanished as a result of natural disasters (such as floods or droughts), attacks by wild animals, overcrowding, and the shift from nomadic pastoral societies to sedentary societies (details are discussed in chapter 5). It is important to note that during the field trip in July-August 2019, the Nilambur valley was witnessed and severely impacted by a flood, which resulted in the permanent disappearance of many medicinal plants.

<Internals\\Interview Transcript\\ FGD-C(1-4)-01-20/0314> - § 4 references coded [2.47% Coverage]

Flood has destroyed most of the medicines. That's why we are going to the hospital nowadays[263].

<Internals\\Interview Transcript\\ IDI-K-05-20/0313> - § 2 references coded [1.44% Coverage]

They are decreasing because the elephants have eaten them. Additionally, a lot of plants are also destroyed by floods[264].

VIII. **Issues related to methodology:** The primary difficulties to the management and preservation of IKH are concerns connected to knowledge management methodology. The fundamental question is whether or not to employ the Western paradigm for gathering, organising, and maintaining. As discussed in detail in Chapter 1, IKH is non-linear, local, culturally embedded, and consists of live, experiential, and enacted knowledge. As a result, it is highly subjective and contextual. Some scholars advocate ex situ conservation strategies, such as isolation, documentation, and storage in international, regional, and national archives (Warren, Von Liebenstein, & Slikkerveer, 1993) (Ulluwishewa, 1993). On the other hand, those who advocate for maintaining distinctions between scientific knowledge and have advocated

[263] Informant No FGD-C(1-4)-01-20\0314 has responded during the FGD among the Chaolanaickan community
[264] Informant no IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community

for the preservation of IK in situ (Agrawal, 1995). As mentioned in chapter 3, STCs, for example, store knowledge of medicines in an ecological context in the form of images. They frequently do not know the name of the medicine or are unable to recognise it outside of the context of the growing place, making IKH management difficult for both in situ and ex situ methodologies.

IX. **Lack of appropriate IPRs and other regulations:** The informant has acknowledged several times that making knowledge public will benefit both the community and outsiders, but they are concerned that it will lead to overexploitation of medicinal plants and a lack of availability when they are most needed. They are also concerned that outsiders will exploit their knowledge for their own financial gain, leaving community members in the dark.

X. **Intergenerational loss of knowledge during inter-generational transfer:** STCs store their knowledge in their minds and pass it on to the next generation through word of mouth, which frequently results in knowledge loss due to limited memory capacity and human error in the process of knowledge transfer. For example, almost all informants admit to knowing less about medicine than their parents or grandparents.

<Internals\\Interview Transcript\\ IDI-K-02-20/0114 - § 1 reference coded [2.22% Coverage]

Researcher: Do you remember all medicines that have taught by your father?

Person 1: No, I forgot lots of medicines. I can't see them today because I have been working somewhere, not in the forest[265].

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[265] Informant no. IDI-K-02-20/0114 has responded during the IDI among the Kattunaickan community

4.5 Conclusion

The results of the study demonstrated that STCs have a very distinctive management strategy for IKH that includes ecological storage and word-of-mouth transfer, making it susceptible to change in the absence of formal documentation. IKH may reflect the wisdom of many generations, but due to the transition led by modernization, the displacement of STCs from their customary lands, and the lack of interest among the younger generation, this knowledge may be rapidly lost.

CHAPTER 5: LIFESTYLE TRANSITION AND ITS IMPLICATION ON THE HEALTH AND HEALING PRACTICES

5.1 Introduction

It was highlighted in the previous chapters that STCs are undergoing a transition in their lifestyle which poses challenges to knowledge management as well as maintaining health and well-being. Whereas this chapter will discuss what is the impact of lifestyle transition, especially from nomadic to sedentarism, on the health outcome of STCs. STCs are an ideal case for studying the impact of lifestyle transition on health outcomes because they have been under pressure to adopt a sedentary lifestyle since colonial times (Suresh, 2020). The basis for the pressure and compulsion was the assumption that nomadic communities are at an early stage of social evolution and the belief in cultural superiority, what is known as "ethnocentrisms" (a belief in the superiority of your own culture) in anthropology. Morgan (1818-81) and Taylor (1832-1917), for example, describe tribes as a type of society representing a specific stage of evolution and labelled them as "primitive" or "early stage of social evolution" ” (Tylor, 1871) (Lewis, 1944) (Anonymous, 2016). The STCs were no different in that regard; scholars such as Thruston (1909) and Luiz (1962) referred to the Aranadan tribe, one of the four STCs, as the "primitive tribe." It is significant to emphasise that the perception problem partly persists today also and continues to influence how government and non-government organisations approach development policy and practice. One example of the perception problem is the Indian Ministry of Tribal Affairs' Development of Particularly Vulnerable Tribal Groups (DPVTGs) initiative. (Ministry of Tribal Affairs, 2019).

In this chapter, the researcher identifies the main factors influencing lifestyle changes in SSTCs and their effects on STCs' health outcomes. Additionally, the study presents a theoretical framework for comprehending how unplanned, intense development may have an adverse impact on STCs' health outcomes. The argument is supported by Orman's theory of epidemiological transition[266], field-collected ethnographic data, and census data on the well-being of STCs. However, it is significant to emphasise that the statistical analysis of the data is restricted to census data since the collection of

[266] (Omran , 1971)

biological samples and medical examination on STCs were outside the scope of this study.

5.2 The Orman's Model of Epidemiological Transition

Abdel Omran proposed the 'epidemiological transition (ET)' theory in 1971, arguing that modernization causes a shift from infectious to chronic diseases (Omran , 1971). In a paper titled "Epidemiological Change: An Epidemiological Theory of Population Change," Orman makes his case based on five propositions. The first proposition of the theory is that mortality is an essential factor in population dynamics. The second proposition asserts that modernization has caused a shift in long-term mortality and disease patterns that can be distinguished by three successive stages of epidemiological change: the "age of pestilence and famine," in which mortality is high and erratic, and average life expectancy at birth is low and variable, ranging between 20 and 40 years; the "age of receding pandemics," in which mortality gradually declines; and infectious diseases disappear. The third proposition states that children and women experience profound changes in patterns of health and disease during epidemiological transitions, resulting in high infant mortality. The fourth proposition contends that long-term population variations in health and disease patterns are linked to demographic, economic, and social variables, as well as mortality. The last proposition discusses three fundamental models of epidemiological transition: (a) the Western or classical model; (b) the accelerated model; and (c) the modern or delayed model.

However, there are a few studies that challenge the applicability and universality of epidemiological transition theory (Caselli, Mesle´, & Vallin, 2002) (Kunitz S. , The value of particularism in the study of the cultural, social and behavioral determinants of mortality, 1990) (Ruzicka & Kane, Health transition: the course of morbidity and mortality, 1990) (Fetter, Coello-Ramirez, Rogers , & Nelson, 1997) (Carolina & Gustavo, 2003) (Ruzicka & Kane, 1990) (Frenk, Bobadilla, Stern, Frejka, & Lozano, 1991) (Armelagos, Brown, & Turner, Evolutionary, historical and political economic perspectives on health and disease, 1961) (Gage, 2005) (Weisz & Olszynko-Gryn, 2009). The main criticism stems from the failure of ET to comprehend the comprehensive nature and historical sequence of mortality transitions (Caselli, Mesle´,

& Vallin, 2002) (Kunitz S. , The value of particularism in the study of the cultural, social and behavioral determinants of mortality, 1990) (Ruzicka & Kane, Health transition: the course of morbidity and mortality, 1990) (Fetter, Coello-Ramirez, Rogers , & Nelson, 1997) (Carolina & Gustavo, 2003) (Caldwell & Caldwell, 1991). The primary criticism of Orman's is that it is based on the erroneous assumption that all countries will have linear transitions that are similar in commencement and pace (Santosa, Wall, Fottrell, Hogberg, & Byass, 2014). The other major criticisms include the concept of epidemiological polarisation (Frenk, Bobadilla, Stern, Frejka, & Lozano, 1991); the question of its generalizability across different racial, sexual, sociocultural, and economic categories (Kunitz S. , 1990); and on its premise that communities will gradually advance to the point where they have virtually eliminated infectious diseases as a major health threat (Ruzicka & Kane, 1990). Nevertheless, despite the criticism and the ongoing debate, ET is quite useful in understanding how modernization impacts a community's health outcomes.

5.3 The Debate of Modernization, Development and Health: A Comprehensive Review

According to modernization theory, development is a uniform evolutionary process that all societies go through, from agricultural, rural, and traditional societies to post-industrialization, urban society, and modern societies (Bradshaw, 1987) (Escobar, 1995) (Chirot & Hall, 1982) (Shrum, 2000). Modernization theory also entails that development is simply a matter of knowledge and technology transfer that is seamless, easily understood, context-free and does not interfere with the existing social and cultural arrangements of developing countries (Herkenrath & Bornschier, 2003). The theory places a strong emphasis on internal causes and sources of socioeconomic progress, including formal education, a market-based economy, and democratic and secular political systems (Shrum, 2000) (Jenkins & Scanlan, 2001) (Ynalvez & Shrum, 2015). However, it does not completely exclude outside influences and sources for social transformation and economic growth (Shrum, 2000) (Jenkins & Scanlan, 2001). The term "development" is highly contested in anthropology. Anthropologists hold very strong and diverse views on development. The development debate is a separate topic of discussion that is beyond the scope of this study; as a result, it is not discussed in depth here. However, it is critical to present a cost-benefit analysis of development in

the context of indigenous peoples (like STCs) to contextualize the discussion of developed and underdeveloped. On the one hand, development implies more opportunities, well-being, and higher living standards. On the other hand, it can be used as a tool or means of control, domination, and exploitation (Bradshaw, 1987) (Chirot & Hall, 1982) (Edelman & Haugerud, 2007) (Herkenrath & Bornschier, 2003). The inadequacy of development in the post-development context and its connections to the problem of pervasive poverty, suffering, and inequalities at several levels, such as social, health, and opportunity have been extensively discussed in the literature (Gracey & King, 2009).

The epidemiological data suggest that numerous present-day indigenous groups are suffering from the burden of chronic diseases (Silburn, Reich, & Anderson, 2016) (Gracey & King, 2009) (King, Smith, & Gracey, 2009). The health disparities are widening between the benchmark population and the indigenous population of the country (Silburn, Reich, & Anderson, 2016) (Gracey & King, 2009) (King, Smith, & Gracey, 2009). According to Siburn et al. (2016), despite the pronounced diversity of indigenous communities, there exists a significant level of similarities in their health and disease patterns. The causes of indigenous health disparities, according to Michel Gracey et al., are poverty, malnutrition, population increase that exceeds a region's carrying capacity, poor hygiene, and environmental contamination (Gracey & King, 2009).

However, an important question remains unanswered: what is the cause of the causes? In another word, what has caused poverty and malnutrition in societies that were once self-sufficient economically? In the succeeding sections, the researcher has identified some potential contributing factors to the lifestyle transition (among STCs) brought about by modernization and development that ultimately led to poverty and malnutrition in indigenous self-sustaining economies.

5.4 Cause of transition among STCs

STCs have traditionally pursued a more natural economy and used indigenous technology. They are heavily reliant on forests and other natural resources found in and around their habitat. The land is not only a source of nourishment for them, but also the

foundation of their socio-cultural activities, livelihood, and existence. Habitually, indigenous communities like STCs were the custodian of the land and their subsistence activities are in tune with the land. However, as a result of the implementation of various developmental programmes and policies (discussed in subsequent sections), their dynamics with the land have been disrupted, resulting in new types of health vulnerability situations, as well as the destruction of knowledge, culture, and other traditional practices.

The researcher identified two themes that summarise the factors that forced STCs to change their lifestyles as well as resulting in negative health outcomes and making STCs susceptible to new types of problems. The themes are deduced from information obtained from STCs and the 2014 report on Indian tribal communities by the Xaxa Committee. The themes are (1) capitalization of nature and (2) unplanned intensive development.

5.4.1 Capitalization of Nature (CoN), Transition and STCs

During the colonial era, tribes (in general) were viewed as 'social fossils' for the reconstruction of past socio-cultural history. Following the end of colonialism, the state (in this context, governments) launched a variety of welfare programmes and development policies to improve tribal peoples' lives and align them with national development goals. This technique proved effective in driving behavioural changes as well as a better knowledge of tribal culture and civilization. Although this method was more effective than colonial policies in improving the understanding of tribal culture and society, it ignores the complexity of the problems and the overall effects of policies on tribal identity, culture, beliefs, health, and relationships with the environment.

Over time, there has been a shift in the policy-making approach, with a bottom-up approach and inclusion of community perspective in the policy draft. However, it has still had unresolved problems of colonial legacies, such as considering nature and natural resources as the capital of the state and exercising control over areas and species. For example, tribes like STCs used to cater for all kinds of needs by sustainable exploitation of nature, but the colonial administration caged the autonomy of tribes

inside constrained geography by creating an extra area out of nature termed "forest" - as a nation-state property. In India, the colonial authority established the additional area known as the "forest" in a memorandum released in 1855 (Suresh, 2020). This legal measure was enacted to give the state sole control over the “forest”, which had previously been managed by local communities. Furthermore, the Indian Forest Acts (IFA) of 1865 and 1878 established the state as a supra-local body and a single stakeholder in the forest and natural resources.

Additionally, by designating the forest as a reserve and protected land IFA1927 strengthened the control of the state over the forest. It is significant to note that the IFA of 1927 continues to serve as the fundamental legal framework for India's forests (Damodaran, 2006). In a nutshell, the IFA 1865, 1878, and 1927 gave the state sole regulatory authority over the species (both human and non-human) and spaces (in a geopolitical sense) of the forest, transferring control from the indigenous people. Furthermore, the post-colonial government continues to control the mobility of indigenous tribes like STCs inside forest regions by implementing a number of new regulations, including as the Wildlife Protection Act (WPA) of 1972 and the Forest Conservation Act (FCA) of 1980. (Damodaran, 2006).

During colonial times, the Indian Forest Act of 1865 (as revised in 1878 and 1927) was used to obtain control of forest resources and acquire forest areas for the construction of infrastructure such as railways and dams (Suresh, 2020) (Ministry of Tribal Affairs, Report of The High Level Committee On Socio- Economic, Health And Educational Status of Tribal Communities of India, 2014). The Indian Forest Act also accorded the state monopoly over forest land to use it for commercial purposes. The act of commercialising the forest and making the state a supra-local body and sole stakeholder in the forest and natural resources can be considered “capitalization of nature”. It has abdicated Tribes like STCs from their role as custodians of the land and forced them to work in forest-based industries. It is important to note that in the post-colonial era, the continuation of colonial practices and the adoption of numerous new forest acts, such as the Wild Life Protection Act (1972), the Forest Conservation Act (1980), the Tree Prevention Act, and the Forest Policy (1988), have not only isolated the tribal population from its natural environment but have also negatively impacted their land, identity, and culture (Ministry of Tribal Affairs, Report of The High Level Committee

On Socio- Economic, Health And Educational Status of Tribal Communities of India, 2014).

As described in previous chapters, STCs are semi-monadic, family-level foraging communities with an economic and cultural system characterised by self-sufficiency and political autonomy. Similar to other tribal groups, STC's way of existence was impacted by the capitalization of nature as well as the laws and regulations mentioned above. It has disrupted their way of life, economy, culture, eating habits, mode of subsistence, and settlement pattern. For instance, STC's subsistence strategy was (is) based on mobility, which includes hunting animals, fishing, and foraging for natural foods and nutrients. Traditionally, they hunt all year, both in groups and alone. However, due to capitalization of nature (CoN), as well as acts and regulations such as those that prohibit hunting animals and restrict people from freely moving through forests to gather food and other necessities, STCs have been forced to give up their political independence, self-sufficiency, traditional diet, cultural practices, and nomadic lifestyle. They have also been forced STCs to adopt sedentary lifestyles, submit to modernization, and confine themselves to a specific geographical area. Additionally, it resulted in changes in food habits, a lack of food and medicine, resource-related conflict, environmental degradation, and a number of new health problems. For instance, STCs' traditional diets included a variety of roots, tubers, leaves, and animals. Conversely, because of CoN, STCs are compelled to adopt programmes like Public Distribution Systems (PDS) and alter their eating habits. The most consumed food in the community at the moment is rice (Kanni). The following excerpts from the IDIs and FGDs highlight the diversity of STCs in their eating habits. A complete list can be found in Table II of Appendix-I, and Fig. 58 shows the information on the diversity of their eating habits in network form. In figure 58, the red dot with a number represents a food name, the blue square represents the community, and the connecting black line represents the usage of a specific food by the community to which it is linked.

<Internals\\Interview Transcript\\IDI-K-06-20/0121> - § 1 reference coded [0.61% Coverage]

Person 1: "Noora, Venni, Kavalakizhangu, Kattukizhangu" are the main items[267].

<Internals\\Interview Transcript\\FGD-K-02-20/0204> - § 3 references coded [6.01% Coverage]

Person 1: we are using tubers like " Kavala, Venni, Naaru and Noore"[268].

Person 2: We steam 'mothaka' (the name is unclear) and then remove the water before cutting it into small pieces. After that, soak the pieces in water for a day. Then re-steam them and serve. We can eat raw Mothaka pieces[269].

<Internals\\Interview Transcript\\ FGD-C-01-20/0314> - § 2 references coded [0.96% Coverage]

Person 1: Kattu kizhangu, Kavala, Noota kizhangu,(They are tubers, not roots).

Person 3: we don't get bored. We used to catch porcupine and eat[270].

<Internals\\Interview Transcript\\ FGD-K-01-20/0112> - § 2 references coded [1.25% Coverage]

Person 2: Naran kizhangu, kavala kizhakku,Benni, Noore, Korne and chhodi are using[271].

<Internals\\Interview Transcript\\ IDI-K-01-19/1230> - § 1 reference coded [1.52% Coverage]

Benni, naara, kavala, kizhangu, churuli, noora and mayala kizhangu. Malyala kizhangu has a round-shaped leaf and doesn't have fibers (Narukal) like naara . And also use churuli, Koombi (their leaves are used), Kona (a kind of tuber), Eenth (cycas circinalis), wild bitter gourd (their leaf also use) and fish from the river[272].

<Internals\\Interview Transcript\\ IDI-K-05-20/0313> - § 1 reference coded [0.56% Coverage]

[267] Informant No IDI-K-06-20/0121 has responded during the IDI among the Kattunaickan community.
[268] Informant No FGD-K-02-20/0204 has responded during the FGD among the Kattunaickan community.
[269] Informant No FGD-K-02-20/0204 has responded during the FGD among the Kattunaickan community.
[270] Informant No FGD-C-01-20/0314 has responded during the FGD among the Cholanaickan community.
[271] Informant No FGD-K-01-20/0112 has responded during the FGD among the Kattunaickan community.
[272] Informant IDI-K-01-19/1230 has responded during the IDI among the Kattunaickan community.

'Cholakkar' and we used to eat monkeys earlier. People got Monkey fever from monkey[273].

<Internals\\Interview Transcript\\IDI-K-02-20/0114 > - § 1 reference coded [0.61% Coverage]

Earlier we used to eat Kavalakizhangu , Noore and Naare (he is showing Naare tuber). It is going to disappear[274].

<Internals\\Interview Transcript\\IDI-D--01-20/0119 > - § 1 reference coded [0.61% Coverage]

.... they only eat rice, which makes them anaemic. They get fish and vegetables occasionally. They have to catch the fish from the river or have to go to the market. In earlier days they used to go to the forest and collect tubers. But not there is a shortage of those edible things.[275]

<Internals\\Interview Transcript\\IDI-K-05-20/0313 > - § 3 references coded [1.85% Coverage]

Person 1 Neerottikayya, Cheenikka, oorila and Moovila are the decreasing plants[276].

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[273] Informant No IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community.

[274] Informant No IDI-K-02-20/0114 has responded during the IDI among the Kattunaickan community.

275 Doctor (In charge of PVTGs health) responded during IDIs. The IDIs was recorded on 9 January 2020.

[276]Informant No IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community.

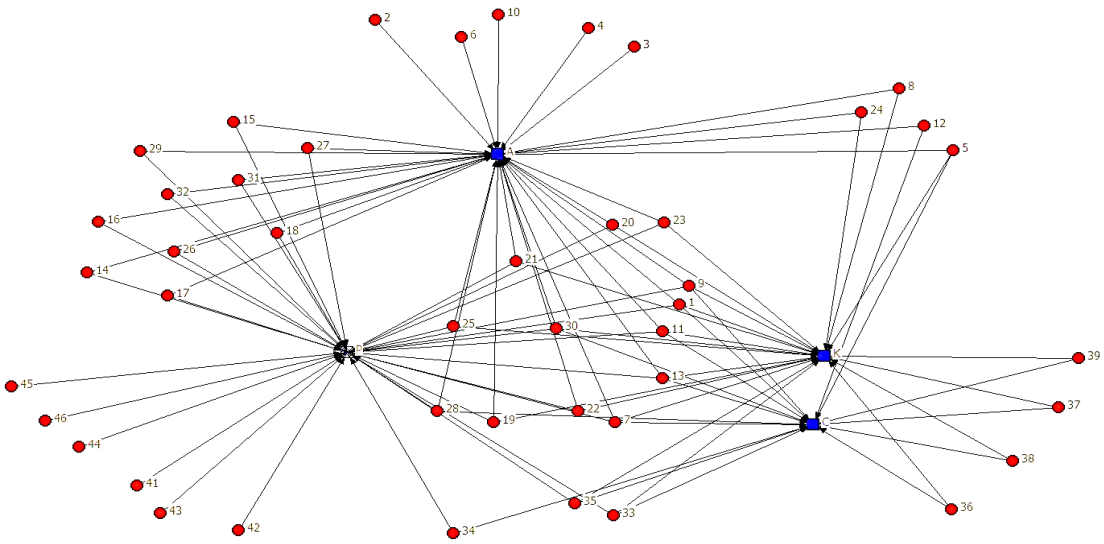

Figure 65 Food habits of the selected communities in the form of nodal network (the map was created using UCI Net 6 after converting data qualitative data into quantitative by using binary no. 0 and 1 (as shown in Table-II).

Furthermore, it is vital to highlight that a substantial area of the Nilambur natural forest (Study Area) was transformed into an industrial forest (teak and rubber plantation) to generate revenue for the state. Between 1957 and 1971, the area covered by teak doubled to 53,483 hectares, reaching a maximum of 78,583 hectares by 1988 (Shrivastava, Venugopal , & Mahapatra, 2021). In addition to the loss of their culture, knowledge (medicine), and other animal resources necessary for STCs to carry on with their traditional subsistence practices and exist in the forest, the conversion caused a food deficit for the forest tribes (as mentioned by STCS in the above extraction). As is well known, STCs obtain their nutrition from the forest and habitat in which they reside. However, due to laws and regulations, STCs are denied access to the forest, which leads to a change in diet (from fibres, fruits, and roots to rice and market foods) as well as increased competition over resources, which can occasionally result in inter and intracommunity violence.

It is also important to note that, according to the Forest Survey of India (2011), the total forest cover in the country is 692, 027 square kilometres, accounting for 21.05 per cent of the total geographical area, and the Integrated Tribal Development Programme (ITDP) covers approximately 411, 881 square kilometres of forest area (Ministry of Tribal Affairs, Report of The High Level Committee On Socio- Economic, Health And Educational Status of Tribal Communities of India, 2014). This means that tribal

regions contain 60% of the country's forest cover. As a result, the protection of forests into Reserved Forests and Protected Forests endangers the tribal homeland and its source of fundamental necessities and existence. To put it another way, it disrupted the STCs' relationships with the environment, forced them to migrate, compelled them to lead sedentary lives, and drove them to abandon traditional subsistence practices and culture. Table III of appendix-I contains the complete community-wise data on STCs' occupation, health, settlement and subsistence preferences.

5.4.2 Unplanned intensive development, Transition and STCs

Following independence, the state (government) enshrined a dual approach i.e., Integration and Development, as a policy for the development of tribal communities such as the STCs (Ministry of Tribal Affairs, Report of The High Level Committee On Socio- Economic, Health And Educational Status of Tribal Communities of India, 2014). To put the policy into action, policymakers have chosen integration programmes that are led by massive displacement-based development to safeguard and protect the tribal population's interests. However, contrary to popular belief, the state has pursued tribal hominization rather than integration in the name of providing services and development. It has resulted in massive displacement and involuntary tribal migration (Ministry of Tribal Affairs, Development Challenges Specific to Particularly Vulnerable Tribal Groups (PVTGs), 2019a). Since its inception, India's planning process has emphasised the inclusion of marginalised tribal communities into the mainstem (as it is known) developmental programme. Initially, it concentrated on allocating adequate resources for the development of Scheduled Tribes, as well as establishing institutions and mechanisms for the delivery of goods and services. For example, the Tribal Sub Plan strategy (TSP) of the Fifth Five-Year Plan (1974-1979), which aims to bridge the gap between Schedule Tribes (STs) and the general population in terms of all socioeconomic development indicators in a time-bound manner (PRS Legislative Research , 2018). It is important to note that two of the STCs are classified as STs by the Government of India, as mentioned in Chapter 2. However, due to factors such as a lack of infrastructure, transportation, communication, a proper delivery mechanism, fund diversion to other sectors and purposes, improper use of funds, and the failure of administrative machinery, the governing authority has not only failed to meet its goal but has also made tribal life more difficult (Ministry of Tribal Affairs,

Report of The High Level Committee On Socio- Economic, Health And Educational Status of Tribal Communities of India, 2014) .

Additionally, India's Ministry of Tribal Affairs also implemented the "Development of Particularly Vulnerable Tribal Groups (DPVTGs)" programme, exclusively for PVTGs, to uplift the Standard of living (Ministry of Tribal Affairs G. , 2015). It is important to note that two of the STCs are classified as PVTGs by the Government of India, as mentioned in Chapter 2. According to the plan, each State/UT must create Conservation-cum-Development (CCD)/Annual Plans for their PVTGs based on an evaluation of their needs, which are then evaluated and approved by the Ministry's Project Appraisal Committee (Ministry of Tribal Affairs G. , 2015) . The DPVTGs include programmes such as housing and habitat, livelihood, equal opportunities and employment (Ministry of Tribal Affairs G. , 2015). However, the National Advisory Council to the Ministry of Tribal Affairs of India notes in a report titled "Development Challenges Specific to Particularly Vulnerable Tribal Groups (PVTGs)" that PVTGs are becoming more vulnerable as a result of the destruction of their traditional habitats and sources of livelihood brought on by unplanned intensive development programmes. (Ministry of Tribal Affairs, Development Challenges Specific to Particularly Vulnerable Tribal Groups (PVTGs), 2019a). Additionally, the report also states that the development programme is causing PVTGs to suffer from hunger, starvation, malnutrition, ill health, and the erosion of traditional occupations (Ministry of Tribal Affairs, Development Challenges Specific to Particularly Vulnerable Tribal Groups (PVTGs), 2019a).

5.4.3 Other factors

STCs also blame climate change and the destruction of their habitat for changes in their lifestyle, food habits, and the loss of medicinal plants. For example,

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<Internals\\Interview Transcript\\ IDI-K-05-20/0313> - § 1 reference coded [0.91% Coverage]

Person 1: we have Koombi and Mothaka. We get fewer plants now. I think after 8 years they will disappear[277].

<Internals\\Interview Transcript\\ IDI-C-01-20/0315> - § 1 reference coded [0.90% Coverage]

... Destruction of habitats and climate change is the major cause of the loss of medicinal plants. The seed of "Kunthirikkam" is not growing. Seeds are there but they won't grow in this climate[278].

<Internals\\Interview Transcript\\ IDI-K-06-20/0121> - § 1 reference coded [4.70% Coverage]

Person1: Climate is changing. we fired wood to get rid of cold in previous years. The temperature has increased these days and facing the unavailability of water during the summer season[279].

Person1: Earlier more water resources are available during the summer season[280].

5.4.4 Transition, Health and STCs

Land, food, and health are all connected for STCs, as was already mentioned, and health is seen as a resource for everyday existence. The literature on indigenous health contains an in-depth discussion of how socio-cultural factors such as connection to the land, identity, and spiritual, mental, and emotional disconnection, as well as environmental degradation and transition in lifestyle, affect the health outcomes of indigenous communities (King, Smith, & Gracey, 2009) (Gracey & King, 2009) (Page, Minter, & Migliano, 2018). In addition to the literature, epidemiological data also show that many modern indigenous populations struggle with the burden of chronic illnesses (King, Smith, & Gracey, 2009). Michel Gracey et al. ascribe this to poverty, hunger, population increase over a region's carrying capacity, inadequate hygiene, and environmental pollution (Gracey & King, 2009).

[277] Informant No IDI-K-05-20/0313 has responded during the IDI among the Kattunaickan community.
[278] Informant No IDI-C-01-20/0315 has responded during the IDI among the Cholanaickan community.
[279] Informant No IDI-K-06-20/0121 has responded during the IDI among the Kattunaickan community.
[280] Informant No IDI-K-06-20/0121 has responded during the IDI among the Kattunaickan community.

However, it is important to note that the transition from a nomadic lifestyle to permanent colonies exposes the inhabitants to diseases brought on by modern food consumption, poor waste management, and contaminated water (Armelagos, Brown, & Turner, 1961) (Orman A. R., 1971). It also increases the risk of nutritional imbalance, chronic diseases, and lifestyle diseases that spread quickly, such as obesity, cardiovascular disease, and physical-social-mental disorders (Armelagos, Brown, & Turner, 1961) (Orman A. R., 1971). For instance, Page et al. (2018) have demonstrated that sedentism has a negative impact on Agta foragers' health outcomes in the Philippines (Page, Minter, & Migliano, 2018).

Scholars have highlighted the following worldwide health problems among present-day indigenous communities.

- High young and child mortality
- High mental morbidity
- The heavy burden of infectious and rapidly acquiring lifestyle diseases
- Malnutrition related diseases
- Diseases related to addictions
- Diseases caused by environmental contamination
- Zoonotic diseases

These diseases are prevalent among the indigenous community because of multiple reasons. For example, high infant and child diseases are because of poor living conditions, inadequate nutrition, and exposure to infections (Gracey & King, 2009). Similarly, there are different factors associated with health problems at different ages. For example,

Population types	Factors	**Reference**
Child	Substandard hygiene, nutrition, immune system, heavy exposure to microbial contamination like-contaminated food, water, breastfeeding etc.	(Gracey & King, 2009) (King, Smith, & Gracey, 2009)

Adolescent	Little knowledge of determinates of health and disease risk because of experience of transition, excessive use of harmful substances like alcohol, tobacco, drugs etc., high risk of sexual activities, violence, trauma, rapidly acquiring lifestyle diseases like obesity, cardiovascular diseases etc. and mental and emotional disorder	(Gracey & King, 2009) (King, Smith, & Gracey, 2009)
Women	Undernutrition during pregnancy, unsupervised delivery, maturational hygiene etc.	

Table 5 Disease factors for different age groups

Following an in-depth investigation of the cause of the cause, the study found that developmental policies such as the promotion of settlement colonies, developmental aids, food through the PDS system, and other superficial designs such as residential housing plans are the cause of the causes for STCs' negative health outcomes. For example, STCs have abruptly adopted a sedentary lifestyle, making them more susceptible to chronic diseases, as proposed by Orman in the epidemiological transition theory and demonstrated by Page et al. (Page, Minter, & Migliano, 2018) (Orman 1971). The table below illustrates how various developments may have impacted STCs' overall health. The current development strategy among STCs is shown in Fig. 59, along with its likely effects on the well-being of STCs.

Transition Factors	**Effect**	**Domain**	**Health Outcome**	**Possible Victims**	**Risks**	**References**

Land appropriation and forest regulations	Forced to alter subsistence strategy and food habits Increased competition for resources leads to inter- and intra-community violence.	Physical, mental and social	It results in chronic illnesses, diseases brought on by nutritional imbalances, and rapidly emerging lifestyle illnesses like obesity and cardiovascular conditions.	Infant, young, adult, old, and pregnant women.	High mortality, malnutrition, mental morbidity, premature birth, low birth weight, immature growth, and anaemia	
Promotion of Sedentism	Exposed to diseases caused by poor waste management and contaminated water. Changes in the way people interact with the environment and with animals	Physical, mental and social	It alters social dynamics and networks and raises the risk of zoonotic and infectious diseases.	All population	Chronic infractions, gastrointestinal infections, renal diseases, skin diseases, respiratory diseases, Illnesses caused by identity deficit because of renegotiation with land and environment, mental health, suicides etc.	(Kunitz S. , 1996) (Stephens, Porter, Nettleton

Developmental Aids	Encourages indirect reliance on government assistance, which leads to the discontinuation of traditional practices	Physical and mental	It causes a shift in settlement patterns and subsistence strategy. For example, the public distribution system caused a change in diet and a health problem. This category includes all of the health problems discussed in the first two sections.	Though all populations are vulnerable but mostly adult males are the prime victims.	Apart from the risk listed in the above two-section diseases led by addictions like alcoholism and other addiction are widespread, and depression and anxiety are also common because of the absence of work and motivation after stopping the traditional occupation	, & Willis, 2006) (King, Smith, & Gracey, 2009) (Gracey & King, 2009) (Page, Minter, & Migliano, 2018) (Orman A. R., 1971) (Armelagos, Brown, & Turner, Evolutionary, historical and political economic perspectives on health
Socio-cultural Dominations	Disruption in families and communities leads to physical and social abuse, as well as a loss of culture, language, and	Physical, mental, emotional and social	It fosters self-doubt, racism, marginalisation, and inferior self-imaging.	All population	depression, anxiety, Illnesses caused by identity deficit, mental health, suicide, the	

	knowledge system.				problem of social cohesion, violence etc.	and disease, 61)
Modernization	Disruption of families and communities carries over physical and social abuse, loss of culture, langue and knowledge system	Physical, mental, emotional and social	It resulted in a health problems as a result of cultural alienation, identity crisis, violence, and abuse, among other things.	Mostly young population	PTSD, depression, anxiety, mental health, suicide, addiction etc.	

Table 6 Developmental programmes and its impact with health outcome of STCs

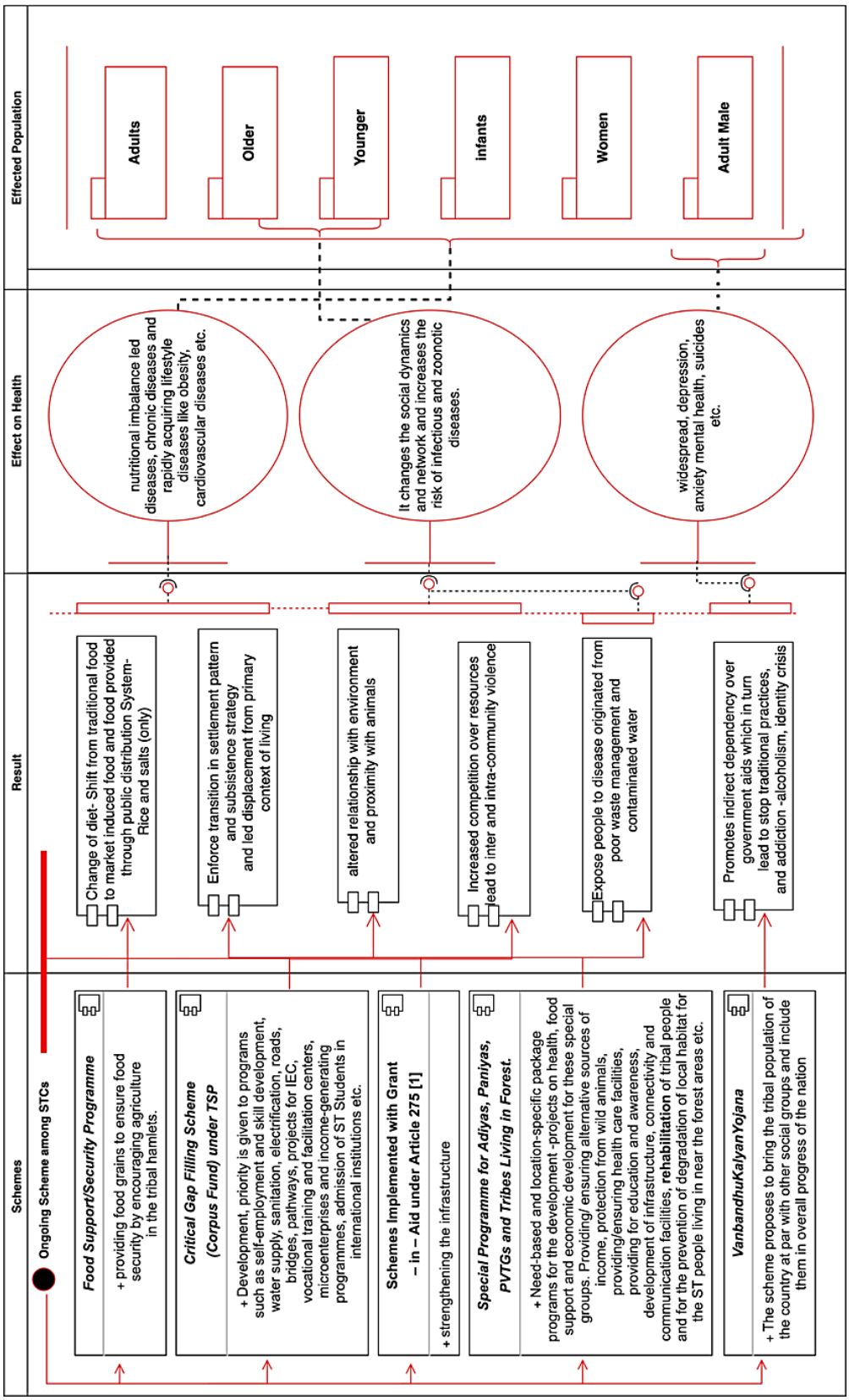

Figure 66 Ongoing development programmes of Kerala and their effect on the health of STCs

5.5 Result

The demographics of STCs from the 2011 Census were divided into 50 categories, including Total Main Workers in the Forestry Sector in the Community (TMWoC), Population Involved in Traditional Occupation (TrO), Workers in Forest Area (WFA), Workers in Non-Agriculture Sectors (WNaS), Family Affected by Malnutrition (FAMln), People with Chronic Diseases (PwCD), etc. Table III of Appendix I contain complete data as well as the full form of the abbreviation.

Pearson product correlation of family of community living in government provides settlement (TFoCLS) and families with malnutrition (FAMln) was found to be perfect positive and statistically significant ($p < 0.01$). This shows that an increase in settlement practice with current food habits (i.e. limited to food provided by the PDS system) would lead to a higher case of families with malnutrition. A similar result was found between FAMln and FoSWAs ($p < 0.01$); FAMln and FoSWEGS ($r= 1$, $p < 0.01$); FAMln and FoSNI ($p < 0.01$); FAMln and FoSWGE ($p < 0.01$) and FAMln and FoSTO ($p < 0.01$). However, the Pearson product correlation of FAMln and families' Family collecting food by the traditional method (FCFTM) ($p > 0.01$) was found to be very high positive but statistically not so significant.

The cross-community comparison of malnutrition cases (Fig.60) and chronic disease cases (Fig.61) shows that communities cholanaickan and Kattunaickan who have experienced the most traniostion in their lifestyle, subsistence and settlement practices are comparably more vulnerable to these diseases.

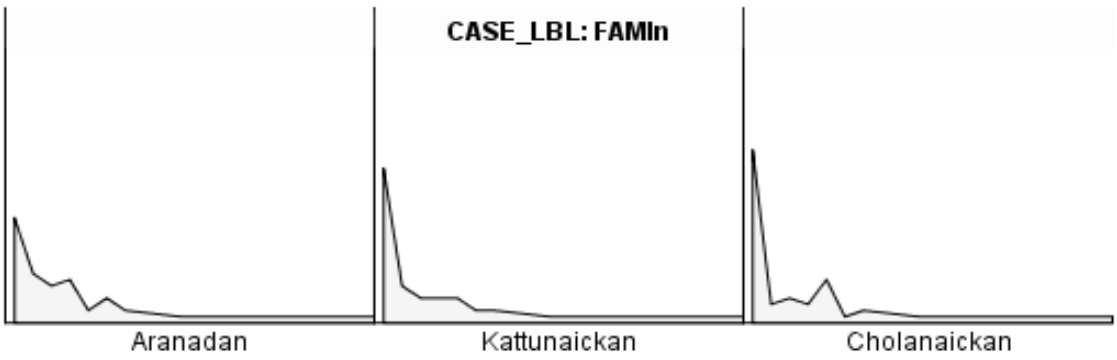

Figure 67 Families with malnutrition

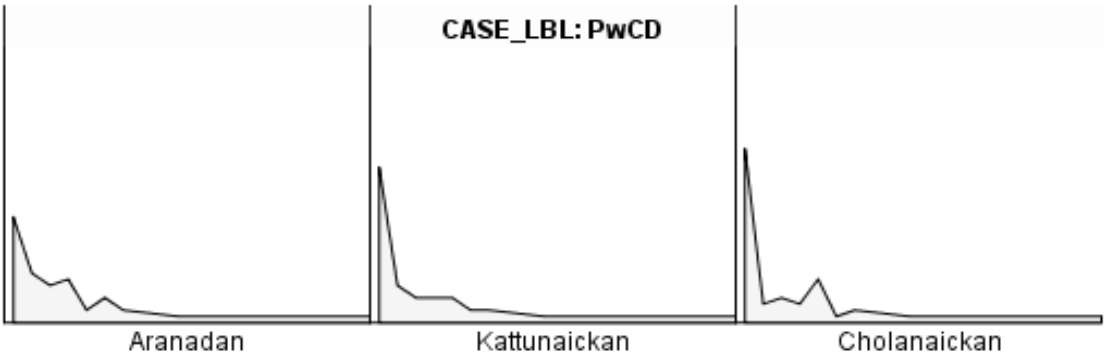

Figure 68 Families with Chronic diseases

Correlations

		FSFA	TrO	TFoCLS	FoSWFBA	FoSWAs	FoSWSE	FoSWEGS	FoSWGE	FoSWOA	FoSNI	FoSTO	PwCD	FAMIn
FSFA	Pearson Correlation	1	.786	.897	.913	.893	.874	.916	.917	.032	.950*	.899	.889	.920
	Sig. (2-tailed)		.214	.103	.087	.107	.126	.084	.083	.968	.050	.101	.111	.080
TrO	Pearson Correlation	.786	1	.978*	.480	.980*	.918	.968*	.967*	.277	.939	.977*	.982*	.965*
	Sig. (2-tailed)	.214		.022	.520	.020	.082	.032	.033	.723	.061	.023	.018	.035
TFoCLS	Pearson Correlation	.897	.978*	1	.649	1.000**	.950	.999**	.999**	.209	.990**	1.000**	1.000**	.998**
	Sig. (2-tailed)	.103	.022		.351	.000	.050	.001	.001	.791	.010	.000	.000	.002
FoSWFBA	Pearson Correlation	.913	.480	.649	1	.641	.611	.681	.683	-.255	.747	.652	.635	.690
	Sig. (2-tailed)	.087	.520	.351		.359	.389	.319	.317	.745	.253	.348	.365	.310
FoSWAs	Pearson Correlation	.893	.980*	1.000**	.641	1	.950	.998**	.998**	.215	.989*	1.000**	1.000**	.998**
	Sig. (2-tailed)	.107	.020	.000	.359		.050	.002	.002	.785	.011	.000	.000	.002
FoSWSE	Pearson Correlation	.874	.918	.950	.611	.950	1	.952*	.953*	.463	.949	.950*	.950	.951*
	Sig. (2-tailed)	.126	.082	.050	.389	.050		.048	.047	.537	.051	.050	.050	.049
FoSWEGS	Pearson Correlation	.916	.968*	.999**	.681	.998**	.952*	1	1.000**	.197	.995**	.999**	.998**	1.000**
	Sig. (2-tailed)	.084	.032	.001	.319	.002	.048		.000	.803	.005	.001	.002	.000
FoSWGE	Pearson Correlation	.917	.967*	.999**	.683	.998**	.953*	1.000**	1	.198	.996**	.999**	.998**	1.000**
	Sig. (2-tailed)	.083	.033	.001	.317	.002	.047	.000		.802	.004	.001	.002	.000
FoSWOA	Pearson Correlation	.032	.277	.209	-.255	.215	.463	.197	.198	1	.163	.208	.219	.189
	Sig. (2-tailed)	.968	.723	.791	.745	.785	.537	.803	.802		.837	.792	.781	.811
FoSNI	Pearson Correlation	.950*	.939	.990**	.747	.989*	.949	.995**	.996**	.163	1	.991**	.988*	.996**
	Sig. (2-tailed)	.050	.061	.010	.253	.011	.051	.005	.004	.837		.009	.012	.004
FoSTO	Pearson Correlation	.899	.977*	1.000**	.652	1.000**	.950*	.999**	.999**	.208	.991**	1	1.000**	.999**
	Sig. (2-tailed)	.101	.023	.000	.348	.000	.050	.001	.001	.792	.009		.000	.001

Table 7 Correlation matrix for family wise

5.6 Conclusion

The argument presented here shows how technology-based development, industrial modernity, displacement-based development, and nature capitalization have all worked together to disrupt the equilibrium of indigenous health, resulting in unprecedented negative health outcomes. As a result, policy reform at the social, economic, and political levels is critical. The progress will be a pipe dream until the following persistent problem is either eliminated or reduced to a nominal level. Undermining indigenous socio-cultural practice, knowledge system, food habits, the authority of elders and ethno-philosophy.

- Poverty induced by indirect dependency and financial aid
- Malnutrition
- Widespread prejudice about the inadequacy of indigenous health mechanism
- The false expectation is that medical intervention can alone solve the indigenous health problem because its approach is curative rather than preventive.
- Bureaucratic mishandling of culturally sensitive issues

It's not as if the government hasn't succeeded in closing the health gap between the indigenous and benchmark communities. Government efforts to curb polio, improve pregnancy outcomes, and reduce deaths from infectious diseases are admirable. However, it can be seen that millennium development goal such as providing a home for families and a public distribution system, increase the risk of diseases led by lifestyle transition.

CHAPTER 6: CONCLUSION AND RECOMMENDATION

The primary objective of this study was to document the indigenous healing traditions STCs and understand the impact of lifestyle transition on their health outcome and healing knowledge system. Following the data analysis in Chapters 3, 4, and 5, this chapter aims to highlight the key findings and concerns presented throughout the study. This chapter represents the study's primary results and draws a conclusion to the primary question posed in Chapter 1. Additionally, this chapter also includes policy and research recommendations.

6.1 Summary of Findings

This study has produced a number of important conclusions related to STC's healing practices and knowledge system. The main findings of the study are outlined in the sections below.

First, the study found that, despite differences in healing techniques and herbal knowledge, all four STCs had essentially identical processes for providing healthcare to their members. In other words, the ethno-philosophy of healing used by STCs is similar, which incorporates intervention from the physical, sacred, and human worlds—three interconnected worlds. For instance, the healing process incorporates the human world as a caregiver or consultant; the physical world in the form of ethnomedicine or physical substances; and the sacred world in the form of spirits and gods.

Second, the research reveals that none of the four STCs has a professional healer (*vaidaim*). Healing knowledge exists as collective knowledge, but its distribution among community members (male and female) is uneven. Healing techniques are known to the vast majority of adult males. Females also have medical knowledge, but their role as healers is limited to home remedies and ailments that only affect women.
Third, STCs view health as more than just the absence of diseases. According to them, health and illness exist on a continuum, and three indices can be used to assess one's level of health: (a) productivity; (b) causal contribution to society's larger goals; and (c) expected functioning behaviours and abilities. Most diseases or illnesses lack a detailed causative explanation, but in cases of deliberate and significant disease implications,

disease causation explanations became more elaborated and included an assessment of recent events affecting the self or immediate group.

Fourth, STCs classify diseases as common or uncommon based on their frequency, familiarity, and collective experiences, and their causes are attributed to natural or supernatural factors., In other words, STC's health model incorporates both naturalistic and supernaturalistic explanations for diseases and disorders. Naturalistic explanations are used to explain diseases that are visible, prevalent in daily life, recurring, minor, and transient. While the supernaturalistic explanation is applied to diseases that are persistent, deliberate, and serious in their implications, as well as when sick people fail to respond to self-medication and home remedies

Fifth, in order to diagnose diseases, STCs aim to establish a one-to-one correlation between the underlying cause of the disease and its external manifestation on the body. To do this, they employ one of two types of diagnostic procedures: either physical/natural means of diagnosis or non-physical/supernatural means of diagnosis. Although the means of the supernatural method are similar among the STCs, the ritual practices differ.

Sixth, STCs incorporate both natural/physical (plant and animal) and supernatural (ritual healings) domains into their healing practices. Although the fundamentals of healing are similar across STCs, the rituals for practising healing and the medicinal plants used in the healing process are not. Based on their cultural beliefs, each community has its own healing rituals. But STCs use more than 200 herbal medicines as a group to treat 50 diseases and ailments. Even though each community has its own unique set of medicinal plants, some plants are used by two or more communities. STCs also employ animal by-products for healing in addition to medicinal plants. Elephants, deer, boar, leopards, fish, snakes, and other animals and reptiles are among the creatures they employ.

Seventh, STCs make use of a pluralistic medical system. They do, however, have a complicated relationship with western medicine (allopathic medicine). On the one hand, they blame western medicine for various health problems, while on the other hand, they consult western medicine in cases of prolonged diseases, a lack of adequate medicine in their catchment area, failure of traditional medicine, serious accidents and injuries,

and complicated delivery. To put it another way, the use of western medicine depends on a number of variables, such as the type of illness, the theory behind its origin, and the efficiency, availability, and affordability of the medical system and its services.

Eighth, according to the study, STCs therapeutic knowledge is non-codified (that is, practised orally) and transpersonal knowledge that results from the complex interaction of variables including context, practices, worldviews, and belief. Individuals acquire this knowledge in a given context through observation, demonstration, supervised learning, experience, and imitation in the absence of institution-based pedagogy, and it is then stored in the ecological context beyond nomenclature. The study also noted that STCs use the notion or concept of secrecy as a tool to preserve their knowledge, claim ownership, and prevent knowledge misuse.

Ninth, the study outlines the difficulties STCs face in managing their knowledge, including the younger generation's declining interest in learning traditional knowledge, the rapid changes in lifestyle brought on by modernization and technology, the lack of knowledge sharing due to complete secrecy, and the disappearance of traditional medicine as a result of natural disasters (such as floods or droughts), attacks by wild animals, overcrowding, and deforestation.

Tenth, the study identifies that STCs are currently undergoing a rapid lifestyle transition as a result of forced sedentarism caused by factors such as capitalization of nature, enforced implementation of developmental programmes and policies, and the results of which are causing a diet shift and a change living conditions, relationship with the environment, and various health problem. The study also discovered that owing to changes in settlement patterns and subsistence systems, STCs have a negative impact on health outcomes and are becoming more prone to chronic and lifestyle illnesses, malnutrition, mental morbidity, anaemia, and other mental health problems.

Eleventh, according to the study, forced sedentarism among STCs caused cultural alienation, identity deficit, language loss, knowledge loss, indirect physical and social abuse, violence, addictions like alcoholism, and issues with social cohesion.

6.2 Conclusion

The study shows that STCS' indigenous knowledge of healing is a culturally modelled worldview and beliefs which are rooted in a historical and environmental context, and includes both physical (plant and animal) and non-physical (ritual) domains. They (STCs) have a very distinctive management strategy for IKH that includes ecological storage and word-of-mouth transfer, making it susceptible to change in the absence of formal documentation. IKH may reflect the wisdom of many generations, but due to the transition led by modernization, the displacement of STCs from their customary lands, and the lack of interest among the younger generation, this knowledge may be rapidly lost.

Technology-based development, industrial modernity, and displacement-based development have all disrupted the IKH paradigm. It has not only resulted in negative health outcomes, but it has also caused fundamental changes in indigenous peoples' relationships with the environment, ultimately leading to transformations in meaning, experience, and belief disposition. Any attempt to bridge the gap between indigenous people and the majority population at the expense of indigenous sociocultural practices, knowledge systems, eating habits, elder authority, and ethnophilosophy will be harmful to the diversity of STCs knowledge system as well as their lifestyle and health.

To comprehend the modern application of STCs' indigenous healing knowledge, it is necessary to first understand how IKH provides healthcare and healing support to their members, which requires an in-depth understanding and exploration of IKH's epistemology and metaphysics.

6.3 Recommendation

According to the study, there is an urgent need for policy reform and the replacement of the top-down, centralised model of development with a bottom-up, inclusive model that takes cultural diversity into account and redefines "progress" and "development" in terms that address local issues and are endogenous. It's also important to note that the search for alternative, inclusive developmental policies first call for reorganising the underlying issue before constructing a framework that is suitable for indigenous cultures. The research provides the following suggestions, which are aimed at the local

level and could produce outcomes in the short to medium range, as well as at the supra-local level and their impact can be anticipated in the medium to long term.

6.3.1 Alternative development and conservation strategies that reduce the gap between people and nature

Even if indigenous communities like STCs are no longer isolated as a result of globalisation, technology, and market access to the indigenous heartland. However, the capitalization of nature, as well as the prevalent strategy for environmental protection through protected areas, represent a worldview that isolates STCs from nature and usually excludes them in order to conserve biodiversity. It results in the continuous loss of subsistence and traditional livelihoods, as well as a negative impact on indigenous health outcomes. It also impedes STCs' ability to conserve and sustainably manage their knowledge and transmit it to the next generation, because, as previously stated, STCs store knowledge in ecological contexts and transmit it to the next generation through the oral medium in the absence of script and proper documentation. As a result, there is a need for an alternative policy that acknowledges the symbiotic link of indigenous people with their land, people, and animals while simultaneously giving them the option to utilise any deployment driven by modernity and technology.

6.3.2 Evidence-based policymaking that does not require the settlement of nomadic peoples

Indigenous groups are susceptible to change, particularly those who have historically been nomadic but are now being pressured or convinced to choose sedentism in light of various development programmes and policies. In STCs communities, these policies have resulted in a wide range of issues, including poor health outcomes, the loss of traditional knowledge and practices, identity deficits, violence, and addiction. As a result, the research suggests that, rather than adopting a linear Western development paradigm, governments should design local-level programmes that are based on data and previous research. The research emphasises the necessity for solutions that complement STCs' lifestyles rather than trying to replace them.

6.3.3 A simple, understandable, and local-level intellectual property law for indigenous people

In order to protect indigenous knowledge from exploitation or misappropriation, both national and international regulatory agencies have created laws. These legal frameworks have addressed matters outside the purview of intellectual property, including the distribution of profits from any commercial use of traditional/indigenous knowledge, the preservation of traditional knowledge in its natural environment, acknowledging the importance of traditional knowledge systems and fostering respect for them, addressing to the actual needs of knowledge holders as well as safeguarding innovation and creativity. However, the most significant gap in this legislative framework is that it is written in a language and style that people with special educational and socioeconomic backgrounds can understand; as a result, it fails to serve its purpose at the local level, where indigenous communities like STCs do not have access due to language, socioeconomic, cultural, and systemic barriers. Therefore, there is an urgent need for legislation that is considerably simpler and easier for indigenous locals to understand. Furthermore, legislative agencies must organise awareness campaigns among indigenous people about their intellectual and other traditional rights on a regular basis, as well as train indigenous individuals on how to interpret these laws in order to protect their culture.

6.3.4 Sensitivity training for government officials and health workers

According to the study, STCs' way of life is determined by their unique worldview; therefore, government officials who work in close proximity to STCs must receive intercultural awareness and sensitivity training. It is necessary because it will assist them in better understanding the socioeconomic structure, philosophical foundations, mode of sustenance, and settlement patterns of STCs. Furthermore, it would enable offices to identify issues with centralised policy and provide them with the capacity to develop local solutions, while also providing them with a clear understanding of the effects of sedentism on STCs' health.

6.3.5 Inclusion of indigenous knowledge in education

The study finds that the government has built hostels for middle schools as well as elementary education centres in the majority of STC settlement colonies. The educational institute follows a similar design to other schools. However, the researcher contends that in addition to providing students with a contemporary education, schools should also incorporate indigenous knowledge into their curricula. It will help indigenous people feel more connected to their land and traditions, as well as reduce knowledge loss and cultural alienation.

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Appendix-I

Table – I: Demographic data of STCs (Census 2011)

Cholanaickan		
Age Group	Male	Female
00-14	87	75
15-64	126	105
64 and above	14	7
Kattunickkian		
00-14	3319	3270
15-64	6247	6348
64 and above	409	436
Paniyan		
00-14	14625	14034
15-64	28386	31150
64 and above	2162	2570
Arnardan		
00-14	39	38
15-64	65	96
64 and above	6	9

Table – II: Food Habit of STCs

Plant source	Name of Plant	A	C	K	P
1	Cheera	1	1	1	1
2	Merukku	1			
3	Aarambuli ila	1			
4	Piranthanila	1			
5	Koombinila	1	1	1	
6	Thaalu	1			
7	Churuli	1	1	1	1
8	Muthanga	1		1	
9	Venni	1	1	1	1
10	Monaykka	1			
11	Kavala	1	1	1	1
12	Kaatttukizhangu	1	1		
13	Njaara	1	1	1	1
14	Karlakam	1			1
15	Koduveli	1			1
16	Monaykka	1			1
17	Mulapuchan	1			1
18	Thakarakumi	1			1
19	Marapuchan	1		1	1
20	Pallanpuchan	1		1	1
21	Muchithadan	1		1	1
22	Pada puchan	1		1	1
23	Mayilan koonan	1		1	1
24	Nellikka	1		1	
25	*Chollan Chakka*	1		1	1
26	*Kattumanga*	1			1
27	Mullambazham	1			1
28	Chalirupazham	1	1		1
29	Naavinpazham	1			1
30	Banana	1	1	1	1
31	Kudambuli	1			1
32	Chalirupazham	1			1
33	*Malaankoonu*		1	1	1
34	*Maankoonu*		1		1
35	*Arikkoonu*		1	1	1
36	*Thairalu*		1	1	
37	*Saadaakoonu*		1	1	
38	*Nellikka*		1	1	

39	*Cheenikka*		1	1	
40	*Kudambuli*				
41	*Noota*				1
42	*Sholavenni*				1
43	Pathivenni				1
44	*Perikkyan*				1
45	*Mothakka*				1
46	*Parangi moonch*				1

Table -III (A): Acronyms for table III B

NoC	Name of Community
TMWoC	Total Main worker in forestery sector in the community
CoFP	Collecton of Forest product
TrO	Traditional Occupation
CoHP	Collection of Herbal plant
WFA	Worker in forest Area
TMWFs	total Main worker in forestery sector
PT	Petty Trade
WMGNREGS	Worker in MGNREGS
WNaS	Worker in non agriculture Sectors
PL	Plantation Labour
GE	Government Employ
OthS	Others
TMWNaAs	Total Main worker in non-agriculture and allied sectors
TMWA	Total Main worker in Agriculture
TMAHs	Total main worker in Animal Husbandry sector
WAs	Worker in Agriculture Sector
TMWAAs	Total Main worker in Agriculture and Allied sectors
TFoCLS	Total family of community living in settlement
FoSWFBA	Family of settlement working on forest based Activity
FoSWAs	Family of settlement working on Agriculture Sectors
FoSWSE	Family of settlement working as Self Employed
FoSWEGS	Family of settlement working under Employment Guarantee Scheme
FoSWGE	Family of settlement working as Government Employed
FoSWOA	Family of settlement working in other activities
FoSNI	Family of settlement having no income
FoSTO	Family of settlement total occupation
TWWoC	Total women worker of the community
WWFs	Women workers in forestry sectors

WWAAs	Women worker in Agriculture and Allied Sector
WWNaAs	Women workers in non-agriculture and allied sectors
CTPD	community total population data
DAPC	Differently abled people in community
PwCD	People with chronic Diceses
BrPwCD	Bedridden Patient with chronic diseases
FAMln	Family affected my Malnutrition
FCFTM	Family collecting food by traditional method
NoDLMC	Number of death due to lack of mecical care
NoDAC	Number of death due to Alchoal Consumption
FIEMT	Families Incurring Expenditure for Medical treatment
FIEA	Familes incurring Expenditure for Alcohol
FOOH	Familes own own house
FHwK	Familes House without kitchen
FHNCWF	Familes house not convinent for whole familes
FHNSDA	Familes house nospace for Domestic Animals
FHwL	Familes House without Latrine
FSFA	Familes settled in forest area
FPFLwT	Familes processing forest land without title
CPFA	Community population in forest Area
TFWSFA	Total Forestry worker settled in forest Area
TAAsWSFA	Total Agriculture and allied sector worker settled in Forest Area
CTFP	community total Female population

Table-III (B): Community-wise data on STCs' occupation, health, settlement and subsistence preferences (Census 2011)

NoC	Aranadan	Paniyan	Kattunayakan	Cholanaickan
TMWoC	118	42408	9464	141
CoFP	13	446	588	102
TrO	0	36	1	0
CoHP	12	27	13	0
WFA	15	493	957	23
TMWFs	40	1002	1559	125
PT	0	11	5	0
WMGNREGS	0	2307	479	0
WNaS	37	1647	300	0
PL	1	216	62	8

GE	2	348	85	1
OthS	4	164	80	1
TMWNaAs	44	4693	1011	10
TMWA	14	478	128	0
TMAHs	1	196	72	0
WAs	19	36039	6694	6
TMWAAs	34	36713	6894	6
TFoCLS	80	21605	5137	101
FoSWFBA	15	335	396	83
FoSWAs	25	18333	4136	0
FoSWSE	11	35	14	0
FoSWEGS	1	377	105	0
FoSWGE	2	196	56	1
FoSWOA	129	87	33	4
FoSNI	3	273	102	2
FoSTO	79	20689	5002	97
TWWoC	63	18822	4258	45
WWFs	23	457	691	40
WWAAs	20	15601	2970	2
WWNaAs	20	2764	597	3
CTPD	247	92787	19995	409
DAPC	41	4178	1089	18
PwCD	44	6605	1467	23
BrPwCD	0	113	34	0
FAMln	31	4682	1374	41
FCFTM	3	110	38	8
NoDLMC	0	1054	240	3
NoDAC	0	125	28	1
FIEMT	72	11322	3369	52
FIEA	57	11658	2909	52
FOOH	64	18507	4550	90
FHwK	33	10700	2567	72
FHNCWF	43	13165	2873	70
FHNSDA	54	19486	4450	92
FHwL	48	11551	3005	79
FSFA	64	4636	3184	97
FPFLwT	2	767	995	17
CPFA	204	19193	12474	392
TFWSFA	38	674	1394	116
TAAsWSFA	28	7140	3826	6
CTFP	140	47675	10042	186

Appendix -II

Table -I: A comprehensive list of medicinal plants used by STCs for respective diseases

Cholanaic	Kattunaick	Paniyan	Local name	Ulcer	Abscess	Asthama	Ba	kpain of	Body pain	Bone fractu	Burns	Chest Pain	Chicken pox	Cholerala	Constipati	Cough	Cough and	Dea	entry	Diarrhoea	Dog bite	Eye pain	Earache	Fever	Foot Corn	Headache	Indigestio	Injury	Jaundice	Kidny Ston	Knee pain	Lepoy	Lice infect	Loose moti	Maignara	Nose	cin	e	Red Eye	Rheumatis	Scorpion	Skin disea	Smallpox	Snake bite	Stomachac	Swelling	Tooth ache	Tuber pois	Urinary iss	Vomating	Worm	Wound	Gum disea	Cancer	prevention	Hiccups	Medicine during pregnancy
	1		Adalodakam																													block	Paralysis									1																
1	1	1	Amalpori																								1													1			1															
1			Anachuvati																																															1	1								
			Anayadiyan																	1																																							
		1	aral																					1																																			
1			Aranamanassur									1																																															
		1	arayal																																																							
	1		Ariyathuvalli																																1									1															
			Bangavalli																								1																															
		1	chama																																							1																
1			Chathavaly																																																							
			Chathavilum paara																																																							
			Chathuramulla																	1																																							
1			Chedanola																					1																																		
	1		Cheenikka																																							1																
1			Cheerappuvalli																								1																													
1			Chelumaddu																																									1															
			Chenathandan				1			1																																																	
1			cheuthen																																									1															
		1	Chevi kizhangu																				1																																		
	1		Chevidupala																				1																																			
1			Chippali																																																							
	1		Chiraappu Valli																								1											1																			
1			Chomakodi Valli																	1																																							
		1	chorakkuvalli																																																							
		1	chukannachandanam																																																							
		1	chunda																	1																																							
	1	1	communist pacha							1																		1																													
		1	Odank																																1																							
1			Dharbhapulla																																																							
		1	Edampirivalayan																																																							
		1	Eanga																																							1															
		1	Eenth																																																						
1			elam																																										1															
		1	elavathu																																										1														
	1		Ennakkara																																																						
1	1	1	Erichilvalli																	1					1		1																																	
			Erikku																						1		1																																
			Erippacha																																																						
		1	erivally																								1																															
1			Erumma										1																																														
		1	Eupatorium																									1																													
		1	Frankincense																																																						
1			idampiri valampiri																																																						
		1	idinigiri																								1																															
		1	Idinjil					1																																																		
1			Iguana			1																																																				
1			Incha																																							1																
1			Inchi																																																						
1			irattavali																																							1																
		1	ithi																																																						
1			Ithikanni																																							1																
1			Kaari																	1																																							
1			Kadaladi											1							1																																					
1			Kadikakki																	1																																							
		1	kaipnaranga																								1																													
1			Kakkathondi																	1					1																																	
		1	kakkatonda													1																																									
1			kakkumavilly																																																						
		1	Kakkumoranam																																																						
1			Kalanthatta												1																																									
			Kalkanjiram																	1																																					
		1	kallupana												1																																										
	1		Kallurmanji																																																						
1		1	Kalluvazha																																																					
		1	kanakaitha					1																																																	
			kanchirakkuru																																																						
	1		Kandavan																					1																																	
	1		kanikonna																																		1																			
		1	kannimeen										1																																													
1			Kanthari mulaku																																																						
1			Karalakam																	1																																							
			Karakadan																																																						
	1		Karimullu													1											1																															
		1	karappu																				1																																		
		1	karimjeerakom		1																																																			
1		1	karinochi													1																																								
1		1	Karlakam																																																					
			Karlath																																							1																
		1	Karmoosa													1																																								
		1	karukappullu																																																					
			Katinji																																																						
1			kattu inchi																					1																																	
1		1	Kattuchulli																				1																																	
		1	kattujerakom																					1																																	
1			Kattulli																						1																																
		1	kayanchi																					1																																
		1	kayaruppanvally																																						1																
	1		Kayyona					1																																																
1			Kayyuchena																																										1														
	1		Keerikizhangu																																										1													
1			Keezharnelli																		1																																				
			Kiriyathu																																						1																
1			Kodampuli																																																					
		1	Kodithoova					1										1																																						
	1	1	koduvally																								1																													
1			Komulla																																	1																				
1			konna																		1																																				
	1		Koombi																																																					
	1		Koova																																																				
	1		Koova with Kalluvazha flour																			1																																		
		1	Kottapazham																																																			
1			Kozhinellu													1																																							
1			Kulanellu													1																																							
1			Kuniyan urumpu																									1																											
	1		Kurumthotti																																																			
1			kurumulaku																																																			
	1		Kurunthotti																																																		
		1	macakara																					1																													
		1	malaamikki																						1																												
	1		Malainchi																				1																														
1			malakayinellu													1																																						
			Malathangi		a																																																
1			Malinga						1																																													
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		1	manjakoori	1																								1																											
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		1	Marathal																																																		
		1	Marottikuru																																																		
1			Maruthu																																																	
			Mayila																																																		
			Mookilum paara																																																	
1			Moorthikkaya																																1																			
1			Moosa																																																	
1			Moothu chedi																																1																			
	1	1	Moovila																					1																													
	1		Mothaka																																																		
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			Mullilakkaya																																																	
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		1	Murikkotti				1																																													
		1	muringa																																																	
		1	Murivootty																																																
1			Muulila																																																	
1	1		Nagathanthi																																																
			Nakanthinu paara																																																
	1	1	Nannari																																1																			
1			Nayamanasissi																																																
			Neem		ni								1																																						
	1		Neerottikayya																																															
1			Nelli																																																
		1	Nellikka																																															
		1	nendanka	1																																														
1			Nilampetta																																																
1			Odanalumbu																																															
1			olabanchi						1																																									
1			Ollan																																															
	1		Ooral					1																																									
			Oorilum paara																																															
	1		Orilla																																															
		1	Ottakallan																																															
	1		Paanal																																															
1	1	1	Padakizhangu																																															
1			padavally																					1																											
		1	pakathimaram																																														
	1		Palmuthuk																																														
		1	pambuvalli																																														
1			Panipanal																					1																											
			Panjashokam																																															
1			Pappan																								1																								
1			Paruva																					1																											
			Payar																																						1												
			Pazhsa ela																									1																								
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	1		poovathi																																						1											
1	1		Poopathiri										1				1																																			
	1		Pothan																																															
1			Povikottta	1																																													
		1	Poyavanna																																														
			Puli ela																																														
	1		Pulichikay																								1																						
1			Pullani					1																																									
1			Punna																					1																									
	1		Puzhu kolli																																													1	
		1	sankupushpam									1																																					
	1		Shathavari																																														
1			Thadiyanvalli																																													
1			Thanni																					1																									
			Thenmezhuku																																														
			Thenu																																														
			Therivalli																								1																						
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	1		Thottavadi																					1			1																						
1			Thottemaran																																														
		1	Thoutha																																					1										
		1	Thumba																								1																						
		1	thumranvally																																														
			Thuppali																																														
		1	todanvalli																																														
			Uduk																																						1										
		1	udumbu						1																																								
		1	uluva		1																							1																						
		1	Ungu																																					1										
			Uria																																														
		1	urumamkaya																	1																													
			Uruvali																										1																				
	1		Uruvanchi																																														
		1	Vallikka				1		1																										1																1	
			Valliurila																																														
		1	vayalukali										1																																					
		1	vayambu																									1																						
	1		vellakurinji																																														
			Vebga				1																																										
1			venduldku																																														
		1	Pal Valli																																						1										

Table -II: A comprehensive list of animal by-products and their use for various diseases

	Aranadan	Cholanaickan	Kattunaickan	Paniyan	Tooth Pain	Muscular Pain	Poison	Cracked Heels	Wound	Skind diseases
Elephant Teeth	1	1	1	1	1	0	0	0	0	0
Monitor Lizard	0	1	0	0	0	1	0	0	0	0
Wild Boar Fat	1	0	1	1	0	0	1	1	0	0
Python Fat	0	0	1	1	0	0	0	1	1	0
Fish oil	0	0	1	0	0	0	0	0	0	1
Leopard Fat	0	0	1	0	0	0	0	0	0	1

Appendix-III

Research Tools (Questionnaire)

Guided open-ended questions (For the reference of the researcher)

(Guided open-ended questions for the General Information)

1. What is the name of the tribe?
2. What is the name of the respondent?
3. What is the age of the respondent?
4. What is the gender of the respondent?
5. Are you married?
6. Do you marry within your community or outside the community?
7. What are the other conditions for marriage?
8. Do age matters in marriage?
9. How many children do you have (how many girls and how many boys)?
10. How many of them are learning your healing skill?
11. Do you teach your healing skill only to your son or daughters also?
12. Are your children interested in this profession?
13. Are your children learning only from you or other people also?
14. How do you choose your successors?
15. How many siblings do you have?
16. How many of them is a healer? (Who are they, brothers or sisters?)
17. What is your relationship with them now?
18. What is your relationship with another community healer?
19. What is the education level of the respondent?
20. What is the history of your tribe?
21. What does your community's name mean according to you?
22. How do you relate with other settlements of your community? Do you have any blood relations with them?
23. What is the history of the nomenclature of your tribes?
24. What is the structure of the community? Is there any head?
25. What is the role and responsibility of the community head?
26. What is your family history (in terms of the profession)?
27. What is the history of your connection with your current land?
28. What is the main profession of the respondent?
29. Is there any other source of income?
30. Do you practice healing?
31. Are you a healer of the area?
32. At which age you have started practising healing?
33. From whom did you acquire the knowledge?
34. Who is going to inherit this knowledge? Are you giving any training to anybody?

35. What are the methods of imparting training (oral or written)?
36. Is there any social hierarchy when it comes to getting knowledge of healing?
37. What kind of diseases do you treat mainly?
38. Is there any specialisation in your practice such as poisonous bites, traditional bone setting, etc…?
39. Whether you use to treat any particular community or all communities?
40. How many people you have treated successfully so far?
41. Who collects the plant for medicine?
42. Do you follow any specific time or day or date to collect the medicine?
43. What is your view on modern medicine?

(Guided one-ended questions for the healer)

1. What is health according to you?
2. What is healing according to you?
3. What all kinds of disease/health problems are frequent in your colony or community?
4. What is the common or rare disease in your colony or community?
5. Who is most affected?
6. How do you identify that a person is ill?
7. What all kinds of diseases are frequent?
8. What are normal or rare diseases?
9. Which diseases are frequent in which season?
10. What do you think, what are the causes of diseases? Is there any supernatural power behind this?
11. What is your theory of diseases (aetiology)?
12. What are the different causes of diseases?
13. Is there any belief associated with the theory of disease?
14. Is there any area wise disease prevalence?
15. How do you recognise the name/type of disease?
16. What kind of disease required professional healers?
17. What are the common and exceptional types of diseases prevalent at different stages of ages in people?
18. What all are the source of disease (according to the respondent)?
19. How do you identify an uncommon disease?
20. How do you identify the common disease?
21. What do you think of that common and uncommon disease (in terms of origin)?
22. What do you think of the origin and spread of disease within the community?
23. How do you treat regular/normal/common diseases?
24. How do you treat uncommon diseases?
25. What is the role of society in the treatment of an uncommon disease?
26. How do you treat the uncommon disease which hasn't ever come across?
27. How do you treat trauma/injuries?
28. How do you diagnose infectious diseases?

29. How do you treat infectious diseases?
30. What do you think of infectious diseases?
31. What do you do in case of an epidemic?
32. What is the treatment for snake bites or similar toxicant bites?
33. How do you identify the types of snakes?
34. What all are the medicine for snake poison healing?
35. What kind of medicine is used (Like Liquid, Paste, dry)?
36. Can you name some common medicine and use processes?
37. How do you identify a plant that has a medicinal quality?
38. How do you select a plant for disease healing?
39. What are the beliefs associated with the collection of plant/selection of method?
40. What is the method for the preparation of medicine?
41. What kinds of traditional methods are being used for processing after harvesting?
42. What is the storage system for prepared and unprepared medicine?
43. Do you use to use a single plant for one disease or in combination with other plant parts?
44. Are there any side effects of medicine you encountered?
45. Can you explain the culinary process in detail?
46. What are the separate diseases in men and women?
47. What are the common diseases in children?
48. What are the common diseases in old men?
49. What are the common diseases in working and non-working people?
50. Who is most affected (among all)?
51. How do you treat a sexually transmitted disease?
52. How do you treat men and women-specific diseases?
53. What kind of disease do you consider an infectious disease?
54. What is the role of animals and minerals in your process of healing?
55. Do you use any animal secondary compound for healing?
56. Do you treat bone fractures and injuries of this kind?
57. What do you know about human anatomy (can you explain?)?
58. What do you know about the human internal organ?
59. What do you do in the condition of injury and blood loss?
60. Does your treatment method involve any kind of surgery (for example in the case of the wound)?
61. According to you which part of the body one should save from injury?
62. What do you do for a serious head injury?
63. How do you decide the dose?
64. What do you think of inherent disease?
65. As a healer what do you think of epidemic (in terms of origin and control)?
66. What is the measure you will suggest taking care of during the epidemic as well as after the epidemic?
67. Can you guess the coming of the epidemic (if yes, How?)?

68. Do you scare of treating infectious diseases (if yes, then how do you treat those diseases)?
69. Is your full family involved in this profession (if yes then do you take care of them getting infected with infectious diseases?)?
70. How do you preserve your medicine?
71. Do you prepare your medicine when any sick/ill person come to you or do you use to prepare medicine in advance?
72. What is the average mortality rate of your community member?
73. What are the preventive measures you take when you go to the forest? Because there are lots of poisonous snakes and insects. How do you keep yourself away from their bites? What are the precautions against them?
74. Who performs healing in your family or community?
75. Do women know healing practices or do only male members perform healing?
76. What kind of healing practices are performed by the women of the family or the community and what kind of healing practices are performed by the male member of the family or the community?
77. What are the roles and responsibilities of family members in healing?
78. Is there any social hierarchy like men or women, head or common people in healing practice?
79. Do you treat outsiders or do you only treat people from the colony or community?
80. How do you manage to heal diseases at home? or what kinds of diseases can be treated in the home?
81. What kind of disease required a healer?
82. What all kinds of methods are involved in the treatment of the disease?
83. Do you use ritualistic healing?
84. Which God do you worship for healing?
85. Do you worship the same god for different diseases or different gods for different diseases?
86. How often do you consult allopathic doctors?
87. Can you describe the situation in which you consult an allopathic doctor?
88. What do you do when allopathic medicine fails to cure the diseases?
89. How much do you charge for their treatment? Is it based on diseases?
90. Do you feel happy when your patients get cured of diseases?
91. Do you think that your practice is different from Ayurveda?

(Guided one-ended questions for household people)

92. How do you use to manage the disease at home?
93. What kind of disease required professional healers?
94. What kind of disease do you treat at home?
95. What are the methods of treatment at home?
96. What all are things involved in the home remedies (plant/plant, animals/animal secondary compounds)?

97. How do you prepare home remedies?
98. What all are the source of disease (according to the respondent)
99. At different times and seasons of the years, what are the types of diseases that are prevalent?
100. How do you take care of the pregnancy period?
101. How do you treat the process of childbirth?
102. How you do treat the initial one year of the child?
103. How do you treat old age people who are ill?
104. How do you treat infectious diseases?
105. What do you think of infectious diseases?
106. What kind of disease do you consider an infectious disease?

(Guided one-ended questions for the healer and common people)

1. Is there any areawide disease prevalence?
2. Since how long are you staying in this area/house? (if any plan to change then When/how/why?)
3. What are the mode and methods of your subsistence pattern?
4. What is the subsistence method (hunting-gathering, agropastoral and Agriculture)?
5. Do you practice hunting-gathering?
6. Where do you live (inside the forest or outside the forest and in the natural cave or built a structured house)?
7. Do you settle permanently in the current living area or do you change place frequently (if yes then how frequently)?
8. what are the problems you use to face in the new area? (If you change the place frequently).
9. What all kinds of animals do you hunt for food and what kind of animal do you hunt for other purposes?
10. What is the method of hunting?
11. What are the tools you use for hunting? (Tools name and its material)
12. Where do you get material for tools?
13. What kind of plant do you use for food?
14. Where do you get those plants?
15. What kind of food do they use to eat (raw or cooked)?
16. What is the method of cooking?
17. What kind of utensils they are using for cooking food?
18. What kind of water they are using (cooking, drinking and bathing)?
19. What is the importance of the animal in your food and food collection system?
20. Do you use domestic animals for your help? (if yes what kind of animal and for what work)?
21. Which place do you keep your domestic animals and how far is that place from your living place?

22. Where do they use to dump their domestic waste and how far is that place from your living place?
23. What all kinds of are diseases spared in the Area (sexually transmitted or non-sexually transmitted)?
24. Do you see any climate change in your area?
25. What climate change do you or your tribe can identify?
26. What are the impacts of climate change do you or your tribe can observe that are affecting the individual/community, land and resources?
27. What are the different impacts of climate change on your tribal culture and sovereignty that your tribes have identified?
28. What are the methods or plans you use to cope up with the change or disaster (like climate change vulnerability assessment, adaptation plan, non-tribal intrusion vulnerability assessment and monitoring the change impact)?
29. Do change impact your health?
30. What is the effect of change you experienced or observed on your health?
31. Does the intrusion of an outsider affect your health?
32. What is the effect of landscape change on cultural resources and what measures are being opted to protect cultural resources?
33. What is the effect of climate change on medicinal plants and biodiversity?
34. What is the effect of a natural disaster like a flood/landslide on the medicinal plant?
35. What are the adapting strategies you are using or observing people using to maintain health?
36. What is the role of the social institution (like family and/or community) or networks (connection with elderly people, religious guru) in the process of healing?
37. What is the role of belief system or faith in healing in your health and health management?
38. What is the impact (positive/negative) of the trade of knowledge on their traditional knowledge system?
39. How do you evaluate the infiltration of non-tribal into their territories?
40. What is the impact of the infiltration of non-tribal on their livelihood and health?
41. How do you avoid getting affected by the infiltration of non-tribal into the territories?
42. What kind of disease is brought by infiltration of non-tribal?
43. What kind of deadly disease has been brought by infiltration of non-tribal?
44. What kind of healing technique or new knowledge has been brought by the infiltration of non-tribal?
45. What is the impact of infiltration of non-tribal on your socio-economic culture?
46. What kind of difficulties do you face while and after changing the place of living?

47. How does the change of the living place affect your medical knowledge system and health?
48. What are the diseases originate after natural deserter (like a flood)?
49. How do you maintain health during and after a natural disaster?
50. What are the preparations before the natural disaster/ during the natural disaster?
51. How do you sense the time of natural disaster now and before?
52. Are there security issues for life-threatening like fear from a wild animal at night, erosion, flood and any other?
53. How old your healing tradition is?
54. How is your approach different from your forefather?
55. From where did your forefather get this knowledge?
56. Did your method of diagnosis (for normal diseases and complicated diseases) and method of treatment has changed through time? (if yes how?)
57. What are the factors responsible for leading to change?
58. How does your treatment method different from the method of another healer (in and outside your community)?
59. How do you memorise the knowledge?
60. Do you have any written manuscript of your forefather?
61. How do you select your successor?
62. Is your healing method different from Ayurveda, Siddha and Yunani (if yes then how?)?
63. Is there any other popular method of treatment in your area?
64. How long does a disease take to heal?
65. What kind of diseases are popular at present?
66. What kind of diseases has extinct?
67. What kind of medicinal plant has extinct and why?
68. Have you seen any epidemics in your area before (like diarrhoea, cholera, plague and nippa)?
69. Have you heard any story of a deadly epidemic from your forefather (if yes, what is the story)?
70. How is your experience of the epidemic different from the story?
71. Do you abandon the land during the epidemic (if yes then where do you use to go and if not, how do you take care of yourself and your family in this situation)?
72. Do you use to come back to your previous abandoned land (if yes then when and why and if no then why and why not?)?
73. Is there any other reason to abandon the land (like lacking medicine or food)?
74. What kind of medicine do you use to prepare medicine in advance and which kind of medicine needs at a time of preparation?
75. What kind of tools do you use to prepare for medicine (for example- stone tools, wood or metal tools)?
76. What kind of vessels do you use for keeping the prepared medicine (for example earthen pot, glass bottle or any other)?

77. How long a prepared medicine can survive?
78. Do all medicine are toxic in nature and taste?
79. Are all toxicant plants are having medicinal quality?
80. Can you tell any non-toxicant medicinal plant or any other minerals?
81. Have you discovered any new medicine (if yes then what and for which disease?)?
82. What is the role of other than a human being in the knowledge system (for example- have you learnt any medicine from the animal?)?
83. How do you test your new medicine?
84. What is the role of fragrance and smell in the selection of medicine?

Information on the knowledge of plants

1. What kind of medicinal do you collect?
2. Do you have any religious beliefs while collecting medicinal plants like chanting of mantras or praying before giving treatment?
3. Do you have any religious beliefs to collect the medicines?
4. Can you name the medicinal plants that you collect from the forest?
5. Are the medicinal plants growing during all seasons?
6. What kind of medicinal plants are seasonal?
7. Do you people use these plants to make medicines?
8. Do you know the use of all the medicinal plants you collect from the forest?
9. How do you differentiate medicinal plants and food-producing plants?
10. Have you found any new medicinal plants?
11. How do you identify plants that have medicinal qualities?
12. Can one plant be used for several diseases?
13. Is there any social hierarchy like men or women for collecting medicines?
14. Is there any gender difference in collecting medicinal plants?
15. Do you have the cultivation of medicinal plants?
16. Do your knowledge of medicinal practices are different from other communities?
17. Do you have any medicines for your own community which is different from other community?
18. Do you share your secret knowledge with your brothers?
19. Why do you keep your knowledge secret?
20. How do you preserve your medicines?
21. Do women/men from your family also know the medicine for healing?
22. What kind of tool is used for collecting plants? Are there any traditional tools?
23. Is there any clash between the two tribal communities in collecting plants because they live in a close area? Is there any boundary or limitation in the area for collecting plants?
24. How are you able to memorise the medicinal knowledge?
25. How do you differentiate between toxic and nontoxic pants while collecting medicinal plants from the forest?
26. How did the flood affect medicinal plants?

27. Can you name the plants (medicinal or food) which are effect by the flood?
28. What kind of medicinal plants have extinct today?
29. Do you remember any plants that you used to get when you were a child but are not available now?
30. Can one plant be used for several diseases?
31. Do you collect medicinal plants prior and keep them for the future?
32. Apart from the plants do you use any other material like animals or minerals for healing, if yes can you can them?

Specific information on medicinal plants:

33. The local name of the plant
34. The scientific name of the plant collected:
35. Type of Plant (wild or cultivated)
36. Distribution (rare or abundant stating reasons why)
37. Changes in abundance of the plants for the last 10 years (more abundant /rarer)
38. Part used for diseases
39. Dried or fresh
40. Method of preparation of medicine
41. What kinds of traditional methods are being used for protecting theses medicinal plants?
42. Storage system:
43. Any side effects reported
44. Any food values
45. Culinary process in detail
46. Is it sold
47. Quantity sold per day/month/year
48. Amount collected per year
49. Buyers (community or all including non-tribal)
50. Price/kg
51. Condition of the plant sold (dry/fresh)
52. Brought to the market (daily/weekly/monthly)
53. Percentage of the people in the area doing the business