3. Research methodology

3.1. Selection of the Study Area

3.2. Preliminary Survey

3.3. Sampling Method

3.4. Methods of Data Collection and Analysis

3.5. Period of Study

3.6. Definitions and Concepts
3. RESEARCH METHODOLOGY

“Every man must be his own scientist
and every village a science academy.

Everyone should exercise the right to be a
scientist or technologist to develop new
technologies or to modify old ones.”

- Mahatma Gandhi

To investigate the interaction of plants with the tribal communities and work out strategies in conserving the ecosystem and to provide futuristic scenarios of the *Paliyans*, and forests, the methods of study are employed in accordance with the methods explained by Schultes, R.E. and S. Von Reis, (1995), Gary J Martin (1995), Wes Sharrock and Bob Anderson (1986), Subramaniya, T. (1996) and Jain, S.K. (1989).

3.1. Selection of the Study Area

Dindigul District of Tamilnadu, India, houses two important hill ranges namely the Palni Hills and the Sirumalai Hills. *Paliyans* are living in both these hill ranges. Micro studies have been carried out at Sirumalai Hills. The Lower Palni hills are purposively selected for the present study. More than 70% of the *Paliyans* are living in the Lower Palni Hills, who are in the transition to the
present living system of the mainstream and they form ample scope for the ethnobotanical study.

The following settlements are selected for the study

Erukalampatti
Kaduguthadi
Kombaikaadu
Korankambu
Kudiraiyaaru Dam
Manathevu
Manjalar
Moolaiyaaru
Vaalagiri and
Vadagarapaarai

These settlements belong to Kodaikanal, Oddanchathiram, Reddiyaarchathiram and Athoor block of Dindigul District. Satellite image of Vadagaraparai, Korankombu and Kudhirayar dam are placed in Plate 3.

_Paliyans_ at Madurai, Theni and Virudhunagar districts of Tamilnadu are also explored to have a holistic understanding of the diversified interaction of the _Paliyans_ to their ecosystems.
3.2. Preliminary Survey

Through a preliminary survey, data on the tribal settlements were collected from the following:

1. Dindigul Collectorate
2. Block Development Office, Dindigul
3. Non Governmental Organisations working with Tribals
4. Activists, Researchers, Social workers and Health workers, working with Tribals

Information about the Paliyans and forests was also collected from the relevant Government Orders and Gazettes, newspaper clippings, magazines, technical reports and web sites. The information collected helped the researcher to have an understanding about the general profile of the Paliyans and their livelihood.

Based on the details collected from the above mentioned sources, a semi-structured interview schedule was prepared and tested with a settlement (Korankombu). In consultation with the Doctoral Committee and the response from the tribal community, the research methods are standardized.

3.3. Sampling Methods

The sampling methods explained by Gary J Martin (1995) and Babbie (1997) were used for the present research study. Purposive random sampling
method was employed to collect data from the 10 settlements (Table: 1). This sampling embodies a representative cross section of Paliyan community of the Lower Palni Hills. This sampling is also based on the geographical area and their accessibility to the forest resources.

Data were collected from

1) the members of the Paliyan settlements,

2) the Governmental Departments and the Non-Governmental Organisations, interacting with the Paliyans

Table No.1: Sample Distribution

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the Settlement</th>
<th>No. of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Erukalampatti</td>
<td>23</td>
</tr>
<tr>
<td>2)</td>
<td>Kaduguthadi</td>
<td>40</td>
</tr>
<tr>
<td>3)</td>
<td>Kombaikaadu</td>
<td>26</td>
</tr>
<tr>
<td>4)</td>
<td>Korankambu</td>
<td>67</td>
</tr>
<tr>
<td>5)</td>
<td>Kudiraiyaaru Dam</td>
<td>53</td>
</tr>
<tr>
<td>6)</td>
<td>Manathevu</td>
<td>42</td>
</tr>
<tr>
<td>7)</td>
<td>Manjalar</td>
<td>18</td>
</tr>
<tr>
<td>8)</td>
<td>Moolaiyaaru</td>
<td>31</td>
</tr>
<tr>
<td>9)</td>
<td>Vaalagiri</td>
<td>21</td>
</tr>
<tr>
<td>10)</td>
<td>Vadagarapaarai</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>359</td>
</tr>
</tbody>
</table>
3.4. **Methods of Data Collection and Analysis**

Normative and explorative methods are employed for the collection of data, which is schematically represented.

Primary data are collected through direct field investigation carried out at the 10 selected settlements. The following research tools are used for the ethnobotanical explorations. Intuitive method is used for the futuristic assessment of the study. As the study is multidisciplinary in approach, tools from fields of anthropology, sociology, ecology and futurology are drawn together.
3.4.1. Participant Observation

The initial ways to gather anthropological information was to talk with the members of the tribal community and also observe and take part in their day to day activities. Notes on the observation of the tribal life and the stock of flora interacting with the Paliyan community are documented. Measurements are qualitative rather than quantitative.

3.4.2. Semi-Structured Interview

The approach in which some questions are determined beforehand and others may arise during the course of conversation is to be recorded in anticipation. Mostly conducted with a single person, it allows the tribals to express their personal viewpoints, discuss, disagreements and also share sensitive information concerning traditional practices. Aged persons are preferred for interviews as they tend to provide an array of information on the plants and their interaction.

3.4.3. Rapid Ethnobotanical Appraisal

The Rapid Ethnobotanical Appraisal technique is an applied part of the PRA exercise. The major objective of the technique is to analyze the tribal’s interaction with their ecosystems. An informant from the Paliyan community is asked for the details on the plants they interact in the ecosystems. Repeated
enquires were made with the informants to ascertain the authenticity of the information. Once the information is obtained from the informant, the same information is verified with two other informants from the same settlement followed by cross checking with another settlement. The exercise is repeated with yet another settlement and thus the species having inter-linkages with the tribal community are listed. The traditional knowledge is thus validated with a minimum of five repeated enquires. Voucher collections are carried out for scientific identifications. The voucher specimens are made in a simple herbarium sheet providing required characteristic features for taxonomic identification (Plate 4). In many cases sketches of plants and photographs are also employed in the process of data collection. The plants are further scientifically verified from the Flora of Palni Hills and their illustrations.

Knowledge of a plant and its application is observed and reconfirmed from an informant at settlement 1 and it is crossed checked with another member of the Paliyan community in the same village. Later the same exercise is followed at settlement 4 and crossed checked with another settlement 9 to validate the species that the same species are well known among the Paliyan community members.
3.4.4. Individual Forecasting

Interviews are carried out with experts from specialized area to help in forecasting the preferable futures towards interlinking the tribals and conserving their ecosystems. Future views are based on judgments from a representative group of experts, considering information that they believe will influence subject of interest and combine their conclusions into futures knowledge. No formal model is used and no two experts are likely to consider the same information in the same way, but it has provided good futures insights in many situations. Interviews were carried out with 15 experts to explore the mode of tribal development and the initiatives taken by Governmental and Non Governmental bodies at National and International levels. (Table 2)
Table 2 Interviews for the Expert Opinion

<table>
<thead>
<tr>
<th>S.No</th>
<th>Experts Interviewed</th>
<th>Representing Organisations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mr. Ashok Raja and Mrs. Mano,</td>
<td>Chairperson, Act India Foundation, Pannaikaadu</td>
</tr>
<tr>
<td>2.</td>
<td>Dr. Maskrenus</td>
<td>Chairperson, PASAM Trust, Kodaikanal</td>
</tr>
<tr>
<td>3.</td>
<td>Mr. Veera Raghavan and Mrs. Girija Veera Raghavan</td>
<td>Chairperson, Palni Hills Conservation Council, Kodaikanal</td>
</tr>
<tr>
<td>4.</td>
<td>Mr. Rajasimhan</td>
<td>Director, READ, Dindigul</td>
</tr>
<tr>
<td>5.</td>
<td>Mr. S Dharmalingam</td>
<td>Headmaster, Government Tribal &amp; Residential School, Moolaiyar</td>
</tr>
<tr>
<td>6.</td>
<td>Mr. Paarthiban</td>
<td>Ranger, Bathlagundu</td>
</tr>
<tr>
<td>7.</td>
<td>Mr. S Senthilkumar</td>
<td>Director, SPACE Kodaikanal</td>
</tr>
<tr>
<td>8.</td>
<td>Mr. Salethraj</td>
<td>Coordinator, HELPS, Kodaikanal</td>
</tr>
<tr>
<td>9.</td>
<td>Mr. Sekar</td>
<td>Field worker, SIDT, Pannaikaadu</td>
</tr>
<tr>
<td>10.</td>
<td>Mr. Kumar</td>
<td>Coordinator, HERO, Kodaikanal</td>
</tr>
<tr>
<td>11.</td>
<td>Fr. Kulandhai</td>
<td>Chairperson, Shenbaganur</td>
</tr>
<tr>
<td>12.</td>
<td>Sis. Amali</td>
<td>Health worker, Pannaikaadu</td>
</tr>
<tr>
<td>13.</td>
<td>Dr. S Udayakumar</td>
<td>Director, South Asian Community Center for Education and Research, Nagercoil</td>
</tr>
<tr>
<td>14.</td>
<td>Rev. Y David</td>
<td>Chairperson PEAL, Madurai</td>
</tr>
<tr>
<td>15.</td>
<td>Prof. B.B. Mohanty</td>
<td>Secretary, Bajiraut Chatravas, Angul, Orissa</td>
</tr>
</tbody>
</table>
3.4.5. Scenarios

Based on the present situation, actions are depicted in likely order of, development. The scenarios provide descriptive sketch outline of a possible future state of the community. This method consists of organizing information and future possibilities into alternative visions of the future. It is especially useful to aid the comprehension of events that seem to contain a mixture of unrelated information. The scenarios are consistent pictures of future possibilities and will be composed of a mixture of quantifiable and non-quantifiable components arranged as alternative logical strings of events. The main advantage of this method is to incorporate uncertainties into perspectives and makes explicit that there are many possible futures. The scenarios of possible, probable and preferable futures are worked out.

3.5. Period of Study

The ethonobotanical Investigation from the Paliyans was initiated during May 2002 and extended to the selected settlements of the Palni Hills till September 2005.
3.6. Definitions and Concepts

Adaptation

The competition between organisms means that those who are best adapted are most likely to survive and reproduce. Natural selection means that over many generations organisms become progressively better adapted to their environment.

Animism

A derogatory anthropological term for what most human cultures have believed throughout prehistory: that the Earth is alive and reactive, as are its many places. Greeks and Romans once thought a "genius loci" or spirit of place inhabited every hill, grove, and stream. Such beings still live in all human mythologies. The modern counterpart is panpsychism, the idea that all things possess qualities of mindfulness or psyche. With the coming of heavy industry, such ideas gave way to the financially convenient reduction of the Earth to the status of a lifeless resource.

Anthropocentric Detour

Deep ecologist George Sessions’ term for the ideological turn of mind Western civilization has taken, accompanied by occasional opportunities to return to a less human-centered way of viewing the world (e.g., Maimonides’
belief that the world was good before humans were created, and Spinoza’s thought that mind is found throughout nature). For many deep ecologists, regarding the natural world only for what it does for us exhibits a regrettable immaturity.

**Biodiversity**

The variability among living organisms, on the earth, including the variability within and between species and within and between ecosystems.

**Bioprospecting**

The process of collecting and testing of biological samples (plants, animals, micro-organisms) and the collecting of indigenous knowledge to help in discovering and exploiting genetic or biochemical resources. Bioprospecting has primarily economic purposes (e.g., new drugs, crops, industrial products).

**CITES**

Convention on International Trade in Endangered Species of Wild Fauna and Flora, an agreement between 103 nations to restrict international commerce involving endangered and threatened species of animals and plants, such as tropical birds, rhinoceros horns, orchids, and ivory.

**Community-Based Organization (CBO)**

Any grassroot organization formed by a small group of local people, which ensures, the development and progress of its own community.
Deep Ecology

A term coined by Arne Naess, to challenge the exclusively human-centered view of the natural world by looking more deeply into questions of our place in it (as opposed to surface environmental reform that addresses problems but not their psychological or philosophical underpinnings). Its two fundamental norms, irreducible to any others: self-realization (as opposed to ego-realization) and biocentric equality that opposes anthropocentrism as the heart of our problem with nature.

Development

A process that enables a community to provide for its own needs, beyond former levels, with dignity and justice.

Ecosystems

An ecosystem consists of a community of organisms and the non-living factors that influence them. The living and non-living elements interact to support and maintain a balance between plant and animal communities within the ecosystem.

Futures studies

It reflects on how today’s changes (or the lack thereof) become tomorrow’s reality. It includes attempts to analyze the sources, patterns, and causes of change and stability in order to develop foresight and to map alternative futures. The subjects and methods of futures studies include
possible, probable and desirable variation or alternative transformations of the present, both social and “natural” (i.e. independent of human impact). A broad field of enquiry, futures studies explores and represents what the present could become from multiple interdisciplinary perspectives. Futures Studies also includes normative or preferred futures, but a major contribution involves connecting both extrapolated (exploratory) and normative research to help individuals and organisations to build better social futures amid a (presumed) landscape of shifting social changes.

**Futurology**

Futurology can be termed as the science of probability that has assumed a triple task of diagnosing the present world, providing a better design for the future as an alternative and evolving practical strategies which are more relevant to the present and the future needs.

**Gaia Hypothesis**

Formulated by James Lovelock (1959) and further developed by Lynn Margulis, the scientific hypothesis that the Earth and its systems work as a self-regulating whole to maintain the biosphere through systemic feedback loops. The hypothesis was invented to answer the question of how certain environmental variables (gasses in the atmosphere, ocean salinity levels) that should be unstable remain in equilibrium.
Gazette

A Gazette is an official journal brought out by the Government. Both the Central and the State Governments bring out their own Gazettes.

Government Orders

The Orders passed by the Central/State Government to execute a particular activity.

Habitat

The place, including physical and biotic conditions, where a plant or an animal usually occurs.

Habitat fragmentation

The breaking up of a habitat into unconnected patches interspersed with other habitat which may not be inhabitable by species occupying the habitat that was broken up. The breaking up is usually by human action, as, for example, the clearing of forest or grassland for agriculture, residential development, or overland electrical lines.

Industrialization

Industrialization is the process of transforming an agricultural (farming) economy into an industrial one, which results in increased number of workers in large new factories, rapid population increase and urbanization. It could
also be defined as the process by which societies are transformed from dependence on agriculture and hand-made products to an emphasis on manufacturing and related industries.

**Impact**

Impact is the outcome or consequence or influence or effect of any event, which could be assessed or measured.

**Implication**

Implication is the implicit conclusion that can be drawn from something. It can also be defined as something that is inferred, deduced, entailed or implied.

**Institution**

Institution can be termed as a custom or a way of life that for a long time has been an important feature of some group or society.

**Keystone Species**

A species that increases or decreases the diversity of a system. Example: otters, which when hunted to extinction remove a check on the sea urchins that will eat local kelp forests on which many other species depend.
Lichen

The symbiotic association of a true fungi and a green alga. The alga makes sugar through photosynthesis, and the fungi fills out the organism while holding it to a surface (rocks, bark, etc.). Lichens pioneer harsh or sparse environments, provide food for grazers, and break down rocks through chemical weathering.

Monoculture

The cultivation of a single crop on a piece of land to the exclusion of other crops. This generally requires large quantities of artificial fertilizers, herbicides, pesticides, nematocides, and other potentially toxic measures to kill bugs and increase yield. Even with these chemical aids, monocultures are prone to disease outbreaks and pest infestations.

Natural Resource

The sum of all physical, chemical, biological and social factors which compose the surroundings of man is referred to as environment and each element of these surroundings constitutes a resource on which man draws in order to develop a better life. Thus, any part of our natural environment - land, water, air, minerals, forest, range land, wildlife, fish or even human population - that can be utilized to promote the welfare may be regarded as a natural resource.
Non-Governmental Organization (NGO)

Any organization that is not a part of the federal, provincial, territorial, or municipal Government, unless otherwise indicated, NGOs include private voluntary organizations, corporations, educational institutions and labour unions.

Participatory Rural Appraisal (PRA)

Participatory Rural Appraisal (PRA) is a technique or tool used by the development NGOs and technical organizations to collect information and make people understand about the natural and man-made resources and social situation of the village so that the data analysed could be used effectively by the people for their individual and collective sustainable development.

Phenology

The study of the relationship between climate and the timing of periodic natural phenomena, such as migration of birds, bud bursting, or flowering of plants.

Rehabilitation

The term ‘rehabilitation’ means the measures taken to bring back to normal life, a person/family/community, affected by a physical/mental illness or natural/man-made calamities.
Scheduled Tribe

Scheduled Tribe is the official term in India to small groups of indigenous people with a common culture and dialect. They are officially regarded as socio-economically disadvantaged and are granted special concessions in recognition of this. The primary source of income of most of these people is from forest products.

Scheduled Caste

Scheduled Caste is the official term in India to the untouchable people, who are given special concessions in recognition of their disadvantaged socio-economic status.

Source of income

The means by which, money is earned, especially on a regular basis to meet the basic requirements of an individual and the family.

Standard of living

Standard of living could be defined as a measure of a society’s economic well-being, i.e., the amount of goods and services that people can afford to buy with their income. It could also be defined as the overall quality of life that people experience.
Sustainability

A character of a process or state that can be maintained indefinitely.

Sustainable Development

Sustainable development implies economic growth together with the protection of environmental quality, each reinforcing the other. The essence of this form of development is a stable relationship between human activities and the natural world, which does not diminish the prospects for future generations to enjoy a quality of life at least as good as the current one.

Traditional Knowledge

Traditional knowledge (TK), indigenous knowledge (IK), and local knowledge generally refer to the matured long-standing traditions and practices of certain regional, indigenous, or local communities. Traditional knowledge also encompasses the wisdom, knowledge, and teachings of these communities. In many cases, traditional knowledge has been orally passed for generations from person to person.