

PROCEEDINGS OF THE WORKSHOP

ON

LOCAL TRADITIONAL KNOWLEDGE RELATED TO BIODIVERSITY

Sponsored by

**NATIONAL BIODIVERSITY AUTHORITY
GOVERNMENT OF INDIA
CHENNAI**

February, 2009

Conducted by



KARNATAKA BIODIVERSITY BOARD

Ground Floor, Vanavikas,
18th Cross, Malleshwaram,
Bangalore

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Welcome Address by
Dr.R.C.Prajapati, I.F.S.
Additional Principal Chief Conservator
of Forests and Member Secretary,
Karnataka Biodiversity Board, Bangalore

The Chairman, National Biodiversity Authority, Principal Chief Conservator of Forests, Dr.D.K.Ved, Sri.Kanwar Pal, Secretary, Environment and Ecology, Ladies and Gentlemen, as a Member Secretary of Karnataka Biodiversity Board and Additional Principal Chief Conservator of Forests I welcome all the participants to this workshop on local traditional knowledge related to biodiversity.

The Karnataka Biodiversity Board was created in 2003 under the Biodiversity Act of Government of India. The Board has taken up the activities such as formation of Biodiversity Management Committees at the level of local bodies in all the districts of Karnataka. The documentation of biodiversity and preparation of People's Biodiversity Registers as per the methodology suggested by Prof. Madhav Gadgil and the National Biodiversity Authority. The documentation work has been taken up in all the districts of Karnataka at the Gram Panchayat level through the Biodiversity Management Committees with the technical advice and guidance by the NGOs, Universities, Colleges, Deputy Conservator of Forests and other experts of various line departments. We are targeting about 160 PBRs and out of which around 60 PBRs have been completed.

The Karnataka Biodiversity Board has taken up the awareness creation programme in respect of various aspects of biodiversity at various levels such as Government servants, villagers, schools college students and general public, Zilla Panchayat Officials involved in various developmental activities.

Unique biodiversity sites are being identified through various agencies with the involvement of BMCs and NGOs for declaring such sites as heritage sites as per the guidelines of National Biodiversity Authority. The work is very slow due to various hindrances in the process.

The Karnataka Biodiversity Board desires to document the local traditional knowledge related to various components of biodiversity during the PBR preparations. It is observed that the people having local knowledge related to biodiversity are not revealing the same for documentation stating various reasons the agencies doing the PBR documentation are having problem because of this attitude on the part of knowledge holders. In order to have a indepth discussion and deliberation this workshop has been arranged. It is suggested to discuss the issue in detail and at the end of the day please come out with workable and practical solution to solve the problems so that the documentation work can proceed smoothly in order to save the local knowledge for the benefit of the society present as well as future and to ensure that the local knowledge should not disappear. Once again I welcome all of you to this workshop and hope for a fruitful discussion. Thank you.

Inaugural Address

By

Dr P.L GAUTAM

National Biodiversity, Chennai.

Ladies and Gentlemen,

I am pleased to know that Karnataka state has taken a lead in implementation of various provisions of Biological Diversity Act. The biological diversity is decreasing due to climate change and unsustainable developments. This is a global problem. This is of concern to us also because we have a rich biodiversity and the knowledge associated with biodiversity is also immense. India is a Megabiodiversity country out of 16 megabiodiversity countries identified at the world level. Every region in the globe is important because it has different flora and fauna. India occupies 4% of the geographical area on the earth and 2.5% of ocean area but has more than 8% of world's plants and animals species. It is observed that economically rich countries are poor in biodiversity whereas economically poor countries are relatively rich in biodiversity.

In 1992, Earth Summit was convened in Rio De Janeiro and three to four points have emerged out of that meeting. The biodiversity maintenance and sustainable use of bioresources come under the sovereignty of concerned country, the country is responsible for its biodiversity, the access to the biodiversity should be facilitated and each country should ensure fair and equitable sharing of resources. The World Trade Organisation framed rules and regulations for the multilateral trade which includes biodiversity also. The WTO recognizes Intellectual Property Rights (IPR). The IPR should be patented and protected. The traditional knowledge needs to be patented and protected.

Since centuries in India, vaidyas, hakims and saints have been practising healing treatments for various diseases the knowledge associated with these need to be protected, but there are certain processes and products that need to be identified under this Act. How do we address these issues? This is a huge task. Karnataka is in the forefront in creating awareness on biodiversity. Under Biodiversity Act a three tier system has been prescribed in creating awareness. The role of National Biodiversity Authority (NBA) is to regulate access to the biodiversity in research where foreigners are involved. It is concerned with documentation and conservation of biodiversity.

The Authority is also concerned with the prevention of invasive/ foreign species of plants and animals into India.

The purpose of this workshop is to create awareness in documentation of Biodiversity and local traditional knowledge related to biodiversity. I am happy to note that Karnataka Biodiversity Board has initiated biodiversity registers in about 150 Gram Panchayats and already completed the documentation in more than 50 Gram Panchayats covering many districts. It is in local language the same should be translated into English. It is advised not to give too much publicity of the species/sites that are rare and unique. Digitization of such material should be done carefully. Access to such information or material should be given on selective basis ensuring the protection of the information so that it is not misused and the benefits should reach the stakeholders.

The NBA has circulated guidelines to the states to select, declare and preserve heritage sites. There are places in India that have rare biodiversity. Such unique sites should be identified, preserved and documentation should be taken up for the benefit of present and future generation. In order to popularize the concept of protection of biodiversity we celebrate 22nd May as International Biodiversity Day. The theme for this year celebration is identified by the CBD as Invasive Alien Species. The year 2010 has been declared as International year of Biodiversity. The State Governments are informed to celebrate these occasions in a befitting manner so that more and more awareness is created among the masses about the biodiversity preservation and the ill-effects of the Invasive Alien Species which are very harmful to the local biodiversity in various ecosystems.

The climate change is a reality. Addressing issues on climate change without thinking of biodiversity is incomplete. This workshop should serve as a starter for creating awareness on biodiversity and its various aspects. There are lot of local traditional knowledge which are passed on orally through generations. In order that such knowledge should be available to the society in perpetuity and be helpful to the people in general. To achieve this objective the local traditional knowledge needs to be documented. The documentation has to be done very carefully. It is hoped that this workshop will think of the documentation process the problems coming in the way and come out with recommendation to solve the problems it is expected that a very good database will be available after the local traditional knowledge is documented which will be useful to the nation in general. In this special effort should be taken so that the sharing of benefit is done properly with the knowledge holders. It is also suggested to document the heritage trees, ponds etc. I wish the workshop a very good success.

Address by the Chief Guest

Sri.S.Nagaraj, I.F.S.

Principal Chief Conservator of Forests

Bangalore

Ladies and Gentlemen,

I am very happy to release the first volume of the Biodiversity Newsletter of this state. In a span of five years, the KBB has undertaken noteworthy projects for which I congratulate the entire team of the Biodiversity Board. Dr. Gautam in his speech has said that we believe in giving and infact forests only give and take nothing. We should think of conservation of Biodiversity including preservation of forests. Forests are dwindling because of unsustainable utilization. It is said that the forests and cultures go together. While deriving benefits from forests, one should also think of sustainability of resources. Today forests are under threat due to unplanned developmental activities like irrigation, mining, etc. This type of awareness campaigns should reach down to the Gram Panchayat and Village levels. The effects of these activities should touch the grass root level. I hope that the deliberations of this workshop will be very useful for planning local health traditional systems and documentation of local knowledge for systematic and sustainable utilization of the bioresources of the country. I wish the workshop a grand success.

ADDRESS BY THE GUEST OF HONOUR

Sri.D.K.Ved, I.F.S.

Director,

FRLHT, Bangalore

Ladies and Gentlemen,

Namashkar! Dr.Gautam, Chairman, National Biodiversity Authority, Dr.Meera Saksena, Principal Secretary, Sri.Nagaraj, PCCF, Govt. of Karnataka, Dr.Prajapati, Addtl. PCCF & Member Secretary, Biodiversity Board, and participants, I thank Dr.Prajapati for inviting me and my organization to participate in this workshop. The area of local traditional knowledge is of keen interest to us because the focus area of FRLHT is on local health traditions. Documentation and assessment of local health traditions in South India is our primary goal. We are trying to understand how to document and how to assess various uses of a particular plant. How the use of a plant is interpreted in Unani, Siddha, Tibetan and Folk traditions? So we are interested in the process of assessment along with the practices because our mission is to revitalize Indian system of medicine and folk traditions. In the system of folk traditions most of the practices are not documented because they are passed on from one generation to another only orally. The extent of knowledge is massive. We are building a database on plants which have been referred in Indian system of medicine. For instance, there are 1540 species of plants which are in use in ayurvedic system of medicine. But there are more than 4600 species of plants which are used in folk traditions. The local people have indepth knowledge about the use of biodiversity and the conservation of that biodiversity is linked up with the culture of the people. So the conservation of biodiversity and the conservation of culture are interlinked. With this brief introduction, I wish all success for this very important workshop.

Address by the Principal Secretary

Smt.Meera Saksena, I.A.S.

Chairperson,

Karnataka Biodiversity Board, Bangalore

Ladies and Gentlemen,

I express my happiness to learn that Karnataka is a pioneer state in Biodiversity Movement and implementation of various provisions of the Act. It is suggested that the state should maintain this lead. I am sure that the Biodiversity Board will help the state to maintain this lead. More pioneering works need to be taken up in the field of Biodiversity conservation and development including the sharing of benefits arising from the use of bioresources. There is negative opinion of many that the Board does everything to curb developmental activities. This is not true. We are committed to developments with sustainable utilization of the resources for the benefit of present and future generation .

The Board will help NGOs, individuals, line departments, etc.in dealing with the problems, in collating data,in assessing the situations, in coming to conclusions and so on in respect of various issues connected to the development incorporating the concern for biodiversity and environment. It will smoothen the process and will remove the administrative bottlenecks. Rules and procedures need to be followed for betterment of the society and proper utilization of resources keeping in view the effect on environment and biodiversity which needs to be maintained for the benefit of all the living beings. I am sure that valuable suggestions will emerge from this workshop and will help us to formulate practical policies. I wish the workshop a success.

A Case Study for Documenting Traditional Knowledge on Biodiversity

Dr.Nandini,

Bangalore University, Bangalore

Abstract

Originally, the People's Biodiversity Register is a programme set up to document people's knowledge of biodiversity, intended to protect people's rights to their intellectual property and natural resources. But with increasing environmental pressure, the tool has also been employed to carry out Knowledge-and-Perceptions (KAP) analysis on environmental pollution, conservation of biodiversity resources and prioritization of environmental issues involving local people. There is a widespread belief that there is no Biodiversity in the urban centers. Almost all of the policy, research and scientific resources directed at Biodiversity conservation are largely focused in biomes outside of urban centers. This is where a large anomaly of protection and conservation of natural resources occurs based on the concept that there is little left to conserve in the urban centers. This study has embarked on critical assessment aimed at highlighting the urban viewpoint in Biodiversity protection and conservation using PBR Tool of analysis and documentation. With the support of the Biodiversity Committee of Bruhat Bangalore Mahanagara Palike (BBMP), the Bangalore Municipal Council and the Karnataka Biodiversity Board (KBB), a pilot study on documentation of Biodiversity resources in the Bangalore Urban using PBR Tool was commissioned for Ward No. 2 in 2007. The study in Ward 2 (Malleswaram) concluded that the urge for Biodiversity conservation of the urban ecology and Indigenous knowledge does run deep with the interviewed local population and especially the elderly. Following the outputs and delimitations of the pilot study, the current study is carried out in phase wise expansion to cover representative samples of the entire city. The objectives of the study in Bangalore Urban include identification of focal issues of environmental importance such as health, education, socio-economic patterns within the ward; identification of species and habitats pertinent to focal issues, and communication of this information towards initiation and development of resources material on the emergent set of habitats and species in the ward. This is mainly based upon the local practical ecological knowledge and willingness to share that knowledge with the general public.

1.Introduction:

It can be argued that it was by far a case of accidental event upon which the concept of People's Biodiversity Register was instituted. The primary goal of PBR was to institute a national response to the threats of Biopiracy which threatened to obliterate the remnants of ownership of biodiversity resources and traditional knowledge from poor countries where eighty percent of the global biodiversity resources were located. In case of India, this threat was exemplified by irresponsible patenting of Indian traditional herbs by US companies. The People's Biodiversity Registers (PBR) thus became an important tool of a biodiversity information system in line with the provisions of the Biological Diversity Act, 2002 which became operational later on. PBR would compile information on variety of environmental issues, such as the status of ecological habitats, biodiversity elements, customary property and access rights, conservation of resources and practices; existing technologies and new innovations pertinent to biodiversity. In effect, PBR was a tool designed to document, store, and protect the national traditional knowledge.

It is important to understand that the general objectives of PBR is to document knowledge of occurrence, practices of propagation, sustainable harvests and conservation, as well as economic uses of biodiversity resources that resides with India's local communities. The tool also serves to document sustainable and equitable share of benefits flowing from the use of such knowledge and such resources. PBR also helps in participatory and active learning promoting environmental education and practical ecological knowledge. This tool was initiated where it mattered most, and that was in rural India with its agricultural and ecological richness. Rural India along with its pristine ecological habitats contained invaluable biodiversity resources that have been estimated to carry the largest biodiversity financial value of US\$ 5 Billion. To some extent since the inception and implementation of PBR tool, the country has managed to document extensively the scale and the magnitude of its

largely untapped reservoir of traditional knowledge, environmental issues, and on biodiversity conservation. Still, the work is ongoing and will take some time before the documentation of major objectives is achieved. However, there is one place where PBR process has largely overlooked and this is within the bastion of human habitats, their industrialization, commerce, and population concentration – the urban centers.

There is a widespread belief that there is no Biodiversity in the urban centers. Almost all of the policy, research and scientific resources directed at Biodiversity conservation are largely focused in biomes outside of urban centers. This is where a large anomaly of protection and conservation of natural resources occurs based on the concept that there is little left to conserve in the urban centers. This is far from the ecological truth. This study has embarked on critical assessment aimed at highlighting the urban viewpoint in Biodiversity protection and conservation using the similar PBR Tool of analysis and documentation.

2. Background to the Study:

One of the interesting aspects of life in Bangalore is the availability and application of an open space (Lung space or a biological element). However the quality of lung spaces in Bangalore has deteriorated over the years due to several reasons. Physical growth, rapid development, increase in traffic, encroachment into parks and green avenues, and also lack of management of open/lung spaces have all contributed to this. The CBD (Central Business District) area of the city which used to cater for a city of 2 million in 1980 has to now cater to a city of 5 million. One can imagine the demand for fresh air and quality of environment in this zone alone.

Any city can be categorized environmentally based on the built-up land, agriculture land, forest land, waste land, water bodies, etc. According to Karnataka State Remote Sensing Application Center, the expansion of Bangalore city derives enormous pressure on the infrastructure which then eats away the natural biological elements that characterize the environmental identity of this city. The satellite and aerial data have derived various and strong information databases on several ecological points of concern within the city. This information has provided us with critical environmental pressures plaguing the city including disappearing frontiers that once demarcated forest zones from built up areas. Due to population increase, there is an excessive demand on land and this has effectively altered the urban ecological balance of the city itself. Lung spaces such as forest, historical avenue trees, water bodies, and city's parks have fallen prey to mismanaged policies of urban planning.

Lung spaces play a critical role in servicing the local ecology and remediate its natural periodical inadequacies. They are the natural remedial biospheres that cancel or reduce degree of environmental deterioration of the city's ecosystem. Moreover, lung spaces are biological elements that act as Carbon sinks to vehicular and industrial emissions, harvest rainwater before filtering and filling it to the ground; absorb noise levels, act as sanctuary for different species including phyto-planktons, zooplanktons, amphibians, reptiles, small mammals, and bird species; play important role in regulating the heat-island effect and temperatures. These, among many more, provide priceless ecological services to urban communities including human beings to perpetuate their own survival.

Bangalore city is undergoing a negative feedback syndrome wherein the physical growth of the city is literally consuming the environmental checks-and-balances spheres that help support a normal life cycle. The last 15 years has seen the physical change in the surface terrain of the city. While the concrete jungle is expanding exponentially, the water sources are invaded and destroyed. The characteristic hilly terrains of the city are being scrapped bare, not only for quarrying, but in efforts to expand settlements and industries into hilly zone which act as vital catchment surfaces for the supply of ground water for the city's 7 Million people.

The forests that used to insulate the city's metro from heat and drastic climatic patterns have now been laid bare and open to more unrelenting pattern of destruction in the race for land grab. What the majority of city dwellers don't understand is the fact that deforestation has already cost the city its characteristic climatic pattern. Water sources are gone and the ground water is increasingly becoming non-potable, corrosive and toxic with industrial outputs such as heavy metals. In the context of the above profile, it is imperative to engage a public participation process using PBR Tool to highlight

major issues of concern in urban ecology and its efforts to conserve and protect biodiversity. In May 2007, the first pilot study on PBR documentation of Urban Centers was carried out in Ward 2 of Bangalore City. This study produced tremendous amount of outputs from people as well as deploying student power in ecological reconnaissance. The issues generated from this pilot study gives a clear picture as to how useful it is to employ PBR Tool in engaging environmental issues of highest priority affecting the urban population, their knowledge and perceptions on environmental conservation and traditional knowledge, their practices in maintaining and sustaining both indoor and outdoor floral diversity and their suggestions in action plan aimed to conserve and protect biodiversity resources. The success of the Ward 2 PBR exercise is the basis of the Phase 2 of the PBR Tool covering extensive areas of Bangalore in effort to strengthen the documentation of biodiversity resources around the city.

3. The Outputs of Ward 2 PBR Pilot Study for Bangalore Urban:

With the support of the Biodiversity Committee of Bruhat Bangalore Mahanagara Palike (BBMP), the Bangalore Municipal Council and the Karnataka Biodiversity Board (KBB), a pilot study on documentation of Biodiversity resources in the Bangalore Urban using PBR Tool was commissioned for Ward No. 2 in 2007. The study in Ward 2 (Malleswaram) concluded that Indigenous knowledge does run deep with the interviewed local population and especially the elderly. Respondents were able to impart a great amount of knowledge on the history and development of their locality vis-à-vis natural resources, faunal and floral species and the causes that paved way for their destruction or extinction from within their locality. With the help of the local residents, the study team was able to compile various dominant species and rare ones such as *Coccoloba nucifera* (20.5%); *Ocimum sanctum* (22.1%); *Eucalyptus* spp. (5.70%); *Pongamia* spp (9.40%); *Papavera somnifera* (9.30%); *Bauhinia racemosa* (12.4%); *Anacardium occidentale* (10.4%); *Terminalia alata* (8.40%); *Jasminum officinale* (0.05%); *Piper betle* (0.36%); *Acacia ferruginea* (0.20%); *Samanea saman* (0.36%); *Ficus virens* (0.15%); *Acacia leucopholea* (0.1%); *Tectona grandis* (0.1%); *Coccinia indica* (0.2%).

Home garden plots, heritage sites, schools, temples, and parks are the most important hotspots for biodiversity conservation as found in Ward 2. These places were considered critical on ensuring the safety growth of several rare and endangered species including the medicinal plants in a critical urban environment. This also supports the fact the Biodiversity and culture are historically inter-related. Our cultural richness is now playing a major part in preservation of our indigenous knowledge and biodiversity preservation. The study also noted an increasing level of awareness among the local residents in application of various environmentally sound technologies such as training of local people for environmental awareness; rain water harvesting technologies, solar energy utilization, domestic waste composting, waste paper recycling and planting trees, herbs, shrubs, climbers, creepers in front houses have also been applied by a number of residents.

The study also identified hotspots of biodiversity degradation in the ward. Encroachment of water bodies; unaccounted sewage, illegal construction activities were discussed as among the factors causing rapid loss of the local natural resources. Urban sprawling has caused a major impact on Ward 2. People are facing a huge problem of flooding during rainy season and air and water pollution poses a great health risk for the local populations. Air pollution related asthma cases have been recorded, water pollution related disorders like gastro-intestinal diseases, diarrhoea, etc have also been noted. Mosquito menace continues to persist even after the rejuvenation of Mathikere lake because of the neglected poor drainage system which even threatens the quality of the ground water bore wells within the area. Illegal dumping of solid waste and unaccounted garbage have been noted and observed by the study team.

According to the residents of the Ward No. 2, there has been a massive decline in the green cover of the Ward which has also caused a decline in the biodiversity area, species richness and abundance. Pollution of natural resources such as small wetlands and nalas running through the ward has rendered the surface water quality of the area unsuitable even for recreational purposes. The railways waste continues to pose a problem to the rejuvenated JP Park (Mathikere) Lake.

4. Objectives of the Current Study:

Following the outputs and delimitations of the pilot study, the current study is carried out in phase wise expansion to cover representative samples of the entire city. The objectives of the study include:

- Familiarization with community members on provisions of the National Biological Diversity Act; harvesting perceptions on the concept of people's biodiversity register and possible advantages of engaging students, scholars, teachers in the PBR process. This also included measuring the level of people's interest in engaging in the PBR process.
- Establishing a network and working relationship of various educational institutions around Bangalore City working on the concept of People's Biodiversity Register and possible educational value of engaging in a PBR process between these institutions and the local (native) people of that particular locality.
- Developing a rapport between the teacher-student team and local community members for documentation and compilation purposes.
- Identification of focal issues of environmental importance such as health, education, socio-economic patterns within the ward.
- Identification of species and habitats pertinent to focal issues, and communication of this information towards initiation and development of resources material on the emergent set of habitats and species in the ward. This is mainly based upon the local knowledge and willingness to share that knowledge with the general public through the interdisciplinary study team.
- Participatory mapping of the landscape of the selected ward.
- Capacity building for teachers, students and local community members and the preparation of the environmental information database of the study area

5. Materials and Methods:

5.1. Selecting and Demarcating the Study Area:

The current study has been engaged on five different zones of Bangalore City. These zones are identified as the Northern, Eastern, South, Central, and Western Zones respectively. A total five (5) Wards have been selected for each zone and fifty (50) households randomly and symmetrically selected from ten (10) streets. Each street therefore has been marked to pick up at least five (5) households. The Major Zones and their Streets are identified with the help of Maps of General Surveyor of India, GIS generated maps, and Google Earth Imageries. The Wards maps and their official demarcations have been procured from the Government of Karnataka. In selecting the study area, all areas which fall under forest Department are not part of the current study.

5.2. Identifying Resourceful Respondents:

In order to avoid biased sampling, Identification of viable and resourceful respondents is often difficult prior to the process. In this case, the exercise is tasked to identify resourceful and knowledgeable individuals during the sampling process and who will then be approached for focal group discussion in later stages of the study to give us detailed chronology of events in an ecological history of the study area and provide timeline analysis of biodiversity trends in that study area along with their own priority issues. In the study, it has been imperative to engage gender-balanced samples on the basis of producing a strong KAP Analysis feedback which can be used in different categories of cross cutting issues.

5.3. Deploying Student Power:

Involvement of students of various interdisciplinary subjects in schools and colleges, preferably from within the selected study area is of a vital step in associating this study with local community in sustainable use and conservation of biodiversity resources. Students can complement their knowledge of the study area with harvesting of local knowledge of various environmental strata and validation of the information thus recorded. This also helps in creation of a local environmental information network between schools/colleges and their own local community. The schools/colleges

can then establish a link as nodal units of that local area with a state or national biodiversity information system.

5.4. Employing Questionnaire Structure:

The questionnaire used is a semi-structured with mix of both open-ended and closed format with both qualitative and quantitative outputs. In addition a questionnaire conductor (a deployed interdisciplinary student) has been enabled to engage the respondent in unstructured (in-depth) interviews with a respondent on perceived focal issues. This could help in formulating future discussion groups on certain issues of priority. The questionnaire has been pre-tested in different models and has been modified consistently with the experimented priority issues. Moreover, this structure has been made to accommodate the outputs of secondary research done in previous PBR studies in India.

The questionnaire has been designed to collect primary information on the respondent's gender, age group, family size, employment category and income group. The questionnaire also attempts to tap into the respondent's experience in the ecological history of his/her area which includes the time that the respondent has been in the study area, his/her knowledge of various flora (economic and ecological) such as Avenue Trees, Heritage Trees, Ornamental Plants, Medicinal Plants, Fruit Plants, Orchids and others.

Information on faunal diversity such as snakes, butterflies, bats, owls, sparrows, is emphasized. The respondent's knowledge of and perception on the ecology of the study area, quality of drinking water, the scale of water, air, noise pollution and industrial units located around the area is documented. Access to energy resources and sanitation services have been highlighted along with the respondent's perception on critical biodiversity issues such as climate change, reduced crop yields, carbon emissions, loss of forest resources and depletion of urban wetlands. Issues and perceptions on Biodiversity conservation are prioritized along with respondent's health patterns.

6. Results and Outputs:

Apart from documenting knowledge and perception analysis (KAP) from the samples respondents, the study is expected to provide a positive feedback on floral and faunal diversity, documentation of unregistered heritage trees, heritage sites, as well as providing current status on issues of environmental degradation and the ongoing physical changes affecting the urban ecology; also on conservation of biodiversity resources within private lands. The study will also help in recording of practical ecological knowledge especially on Traditional Knowledge and help highlight people's aspiration on how issues of environmental concern should be tackled. This could include a co-ordination with local councils, Government agencies, educational and scientific institutions, up to the state and national levels.

7. Conclusion

The PBR Study on Bangalore Urban is very much in its inception stage. This study is a primary attempt to use this tool to involve full people's participation and help reduce the knowledge gap that currently exists between local agencies, educational institutions, and local citizens in tackling problems of environmental degradation of their urban ecology. By engaging on this active participatory tool, a multi-pronged concerted action (involving scientific and policy making) to restore, conserve and maintain the biodiversity resources of our urban ecology can only then be made possible. This study has embarked to attempt just that.

Acknowledgment:

We wish to highly acknowledge the help of Dr. Ramesh C. Prajapathi, IFS; Addl. PCCF & Member Secretary, Karnataka Biodiversity Board who was actively involved in the Pilot Study of Ward No.2 and Sri Yellappa Reddy, IFS Retired. We also wish to acknowledge all the members of the Bangalore University study team that was involved in the pilot PBR Study for Bangalore Urban (Ward No. 2.). The Lecturers and Professors of Bangalore University including Dr. N.Sunitha, Dr. Ashok Hanjagi, and Dr. Santaveeranna Goud. We are also indebted to Research Scholars of Department of Environmental Science, Bangalore University - Mrs Sucharita Tandon, Mrs Anupama B.S., Mr. Durgesh, Ms. Pavithra. We are also grateful to the MSc students of Departments of

Geography and Environmental Science, Bangalore University - Mr.Nandagopal P, Mr.Rajkamal, Mr. Rajanna A H, Mr. Syed Yaseer Arafath, Ms Bindiya C, Ms. Shashikala, Ms.Deepthi N, Ms Anitha, Ms Asha bai, Ms Soumya, Ms Brunda Gourav, Mr.Pradeep, Mr. Muniraj, Mr.Mahesh, Mr.Vinay, Ms Malkan Mussarath, and Technical Assistance from Mr.Keerthi Kumar C. K.

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Introduction of Unani system of medicine, conservation & sustainable use of medicinal plants

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UNANI - TIBB

- Unani system of medicine is a great healing art as well as science.
- It treats a person as a whole not as a group of individual parts.
- It is aimed at treating body, mind and soul.
- It is a science of which we learn various states of body in health and when not in health and the means by which is likely to be lost and when lost likely to be restored - AVICENNA
- Unani medicine is ancient Greek medicine that has evolved within the Muslim world for the past 13 centuries (Unani is an Arabic spelling of Ionian, meaning Greek).
- Greek medicine, greatly simplified for presentation here, was based on the concept of balancing body humors by “Tabiat”(Medicatrix materica) the supernatural power in the body.
- They either fell out of balance, which might yield diseases (depending on circumstances), or were restored to balance to heal diseases.
- The system involved four elements, thus differing from the Ayurvedic system of three doshas and the Chinese system of five elements.
- The original Greek and the resulting Unani systems involve these four elements: earth, air, water, and fire; along with four natures: cold, hot, wet, and dry; and four humors: blood (which is hot/wet), phlegm (cold/wet), yellow bile (hot/dry), and black bile (cold/dry).

Historical aspects

- (Hippocrates 460-377 BC).
- A number of other Greek scholars enriched this system considerably, of them Jalinus (Galen 131-200 AD) who drew inspiration from Hippocrates stand out as the one who stabilized its foundation on which Arab physicians like Rhazes (850-923 AD) and Avicenna (980-1037 AD) constructed an imposing edifice. Hence it is also known as Greek or Arab medicine.
- This system also enriched by imbibing what was best in the contemporary systems of medicine in Egypt, Syria, Iraq, Persia, China, India and various parts of Central Asia. At that time Greek medical knowledge was known to be the best medical science.
- In India, Unani system was introduced by Arabs and soon it took firm roots in Indian soil and has been serving vast sections of the people in the country.

BASIC PRINCIPLES

- Unani System of Medicine the human body is considered as a single unit, made of seven components known as Umoor e Tabiya.
- These seven components are Arkan (Elements), Mizaj (Temperament), Akhlaat (Humours), Arwaah (Life force), Aaza (Organs), Quwa (Faculties), Afa'al (Functions).
- The body has the simple and compound organs, which receive their nourishment through four Akhlaat (Humours) i.e.Dam (Blood), Balgham (Phlegm), Safra (Yellow Bile) and Sauda (Black Bile).
- Unani physician believes that health is a state of body in which there is equilibrium in the humours and functions of the body. When the equilibrium of the humours is disturbed quantitatively or qualitatively or both and physiological functions of the body are deranged due to the abnormal temperament of affected organ or system resulting in disease.
- Therefore, the aim of Unani physician is to find out the cause of the underlying disruption of humours, so that it can be corrected and disease be cured.

PREVENTION OF DISEASES

ASBAB E SITTA ZAROORIYA- SIX ESSENTIAL FACTORS

- Prevention of disease is as much a concern of the system as curing of sickness. Right in its formative stages the influence of the surrounding environment and ecological conditions on the state of health of human beings has been recognized.
- There is emphasis on the need for keeping water, food and air free from pollution. Six essential pre-requisites have been laid down for the promotion of health and prevention of disease. These are
 - Air
 - Food and drinks
 - Bodily movement and repose
 - Psychic movement and repose
 - Sleep and wakefulness
 - Evacuation and retention
- The diagnosis process in Unani system is dependent on observation and physical examination.
- Diagnosis involves investigating the cause of disease thoroughly and in detail. For this physicians depend mainly on Pulse reading and examination of urine and stool and also with the help of simple modern gadgets.
- The various treatments recommended by Unani physicians are :
 - Ilaj bil Ghiza (Dieto therapy)
 - Ilaj bid Dawa (Pharmaco therapy)
 - Ilaj bit Tadbeer (Regimenal therapy)
 - Ilaj bil Yad (Surgery)



- If the treatment is possible by diet only than the drugs should never be used.
- Most of the diseases can be cured by administration of specific diets or by regulating the quantity and quality of the food, for example cold water is better for the person possessing hot temperament while bad for the person having cold and wet temperament.
- If the shift is of greater degree from normal condition and dietotherapy alone is not sufficient then pharmacotherapy is advised in addition to the diet therapy.
- These drugs may be derived from plants, minerals or animals.
- Pharmacotherapy (Ilaj-bid-Dawa) is mainly dependent upon local available herbal drugs which make the system indigenous.
- In Unani Medicine, single drugs or their combination in raw are preferred over compound formulations.
- Further the materia medica of Unani Medicine being vast, the medicines are easy to get as most of them are available locally. The naturally occurring drugs used in this system are symbolic of life and are generally free from side-effects.

- Such drugs which are toxic in crude form are processed and purified in many ways before use.
- The Greek and Arab physicians encouraged poly-pharmacy and devised a large number of poly-pharmaceutical recipes which are still in vogue.
- In Unani Medicine compound formulations are also employed in the treatment of various complex and chronic disorders.
- Since emphasis is laid on a particular temperament of the individual, the medicines administered are such as go well with the temperament of the patient, thus accelerating the process of recovery and also eliminating the risk of drug reaction.
- Unani physicians attempts to use simple physical means to cure a disease. But for some specific and complicated diseases, special techniques are prescribed. These may be used in adjuvant to Dietotherapy and pharmacotherapy.
- These are the various rejuvenate and detoxification drugless regimens/ therapies. They are not only curative but are also widely used for the prevention of diseases.

Some of commonly used Regimenal therapies are as follows:

- Haman - Turkish bath & various types of medicated baths
- Dalak - Massage and Physio therapy
- Riyazat - Physical exercise
- Takmeed - Fomentation
- Hijamat- Cupping
- Fasad - Venesection
- Ishaal - Purgation
- Qhai - Emesis
- Idrar e Baul - Diuresis
- Kai - Cauterization
- Taleeq - Leeching
- It is a steam room where facilities are available for a bath followed by shower and massage.
- It improves general health and also proves helpful in treating various diseases.
- It reduces the viscosity of the humours and improves health of the debilitated individuals.
- It improve metabolism, increase innate heat of the body and excrete waste products through skin.

Dalak - Massage and Physiotherapy

- Any method of pressure on or friction against or stroking, kneading, rubbing, tapping, pounding, vibrating or stimulating of the external soft parts of the body with the hands or other objects like rough cloth with or without rubbing oils, creams, lotions, ointments or other similar preparations used in this practice.
 - Unani medicine describes detailed types of massage e.g. hard massage, soft massage, prolonged massage or moderate massage.
 - Massage therapy improves functioning of circulatory, lymphatic, muscular, skeletal and nervous systems and may improve the rate of recovery of body from injury or illness.
 - Massage relax muscles, increase circulation and remove metabolic waste products.
 - Massage therapy may be useful in several symptoms and diseases like anxiety, tension, depression, insomnia, stress, backache, headache, muscular pain and some form of chronic pain.
-
- Any type of exercise (hard, moderate or light) produces different effect in the body.
 - The moderate exercise increases Hararat e Ghariziya (vital force of the body) helps to eliminate the waste products of body through urine, stool and sweat etc.
 - It makes the organs stronger and increases the appetite.

Takmeed - Fomentation

- It is a warm covering to a part of the body to relieve pain and inflammation.
- Diathermy should always be restricted to the level of tolerance.
- Hot fomentation treatments can be used in a variety of acute conditions including chest colds, muscle spasms, gallstones, dysmenorrhoea, insomnia and backache etc.

Hijamat - Cupping

- It is a method used for local evacuation or diversion of morbid humours in which a horn is attached to the surface of the skin of the diseased part through negative pressure created by vacuum. The vacuum is created by the introduction of heat or suction. Now, this horn is replaced by a glass cup, hence the procedure is known as cupping.
- Cupping is of two types Hijamat Bilshurt (wet cupping) i.e. cupping with blood letting and Hijamat Bilashurt. (dry cupping) i.e. cupping without blood letting.
- It is useful in the treatment of heaviness of head, asthma, dyspnoea, migraine, headache, hemorrhoids, amenorrhoea, sciatica, gout and arthritis etc. cupping is done on different sites of the body to cure various diseases e.g. cupping is done at the back of neck for heaviness of eyes, forehead and inflammatory conditions of the eyes.

Fasad – Venesection

- Is a surgical process in which a blood vessel specially vein is cut open by a surgical knife to shed excessive or impure humours.
- Excessive or abnormal humours are removed in the same proportions as present in the blood vessel.
- It is used to maintain normal volume of blood in people who are predisposed to develop the disease of excess blood.
- To check Kasrat e Tams (Menorrhagia) and Rauf (Epistaxis) and to cure splenic disorders, Bawaseer e Damvi (Haemorrhoids), Warm e Khusiya (Orchitis), Iltihaab e Reham (Metritis) and Iltehab e Kabid (Hepatitis).

Ishaal – Purgation

- The whole body or intestines are cleansed of accumulated toxins through the use of laxatives and purgatives by this method.
- Mild, moderate and strong laxatives may be used depending upon the prevailing condition.
- Unani system possesses various medicine which are used for purgation e.g. Turbud (Operaculina terpeethum), Ghariqoon (Agaricus alba), Saqmonia (Convolvulus scammonia), Aftimoon (Cuscuta epithimum) and oil of Badam (Prunus amygdalus) etc.
- It is used to achieve detoxicating effect, to resolve the body matter and to treat chronic constipation.
- It is the reflux act of ejecting the contents of stomach through the mouth.
- The main purpose of vomiting is to eliminate toxic substances from the stomach.
- Many drugs can be used for this purpose. e.g. Turb (Raphanus indicus), Kharbaq (Oroxylum indicum), etc.

Idrar e Baul - (Diuresis)

- It is the production of an unusually large amount of urine.
- It is an important tool for evacuation of waste products from the body.
- There are many drugs which are used for this purpose. e.g. Kharpaza (Cucumis melo), Kasni (Cichorium intybus), Ghafis (Gentiana dahurica) and Kasoos (Cuscuta reflexa) etc.
- The method is used to excrete poisonous matters, waste products and excess of humours through urine and to purify blood. It is also helpful in the treatment of cardiac, hepatic and renal disease.
-

Kai - Cauterisation

- It is an effective method for the treatment of several conditions e.g. destructive lesions, removal of putrefactive matter and stoppage of bleeding etc.
- Unani physicians have preferred Mikwa (Cauterant) made of gold.
- It is also used to cure warts and moles etc.

Taleeq - Leech Therapy

- It is a unique method of removal of mawaad e Fasida (bad matters) from the body.
- Leeching is better than cupping in drawing the blood from deeper tissues.

Contribution Of Unani Physicians in field of Medicine:



Avicenna In his book “Canon of Medicine” has described meningitis so accurately in detail that it has

Scarcely required any additions even after 1000 years.

● He was first person to describe intubation (surgical procedure to facilitate breathing). Western physicians began to use this method at the end of 18th century.

- Avicenna described contamination of the body by foreign bodies prior to infection and also devised the concept of anaesthetics.
- He accurately described surgical treatment of tumours, saying that excision should be radical and all diseased tissues be removed, including amputation and removal of veins running in the direction of the tumour. He also recommended cauterization of the area if needed. This observation is relevant even today.
- The Arab physicians developed a “soporific sponge” (impregnated with aromatics and narcotics and held under the patient’s nose), which precede modern anesthesia and also described how “minute bodies” enter the body and cause disease – well in advance of Pasteur’s discovery of microbes.
- The use of plaster of Paris for fractures was a standard practice. It was rediscovered in the West in 1852.
- Avicenna described tuberculosis as being a communicable disease.
- Al Rhazes (865-925 AD) was first to describe smallpox and measles. Al Hawi / Liber Continens
- The Arab surgeon Zohrawi (Abulcasis) was first to describe Hemophilia, he was first surgeon in history to use cotton which is an Arabic word for surgical dressings for control of hemorrhages.
- Ibn Nafees (1210-1288 AD) discovered pulmonary blood circulation
- Jabir Ibn Hayyan/ Geber (8th century) known as father of chemistry invented the methods of evaporation, dissolution, crystallization, calcination and also distillation apparatus.
- He discovered the formula of Aqua regia, nitric acid, sulphuric acid etc.

Vydy Gidamulike Samshodhane & Samrakshane
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ನನ್ನ ಈ ಲೇಖನವನ್ನು ನನ್ನ ಅನುಭವದಿಂದ ತಮ್ಮ ಮುಂದೆ ಇಡುತ್ತಿದ್ದೇನೆ. ನಾನು ೩೦ ವರ್ಷಗಳಿಂದ ನಾಟಿ ವೈದ್ಯನಾಗಿ ಮಂಡ್ಯ ಮತ್ತು ಬೆಂಗಳೂರು ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಗಿಡಮೂಲಿಕೆ ಔಷಧಿ ಪ್ರಚಾರ ಮತ್ತು ಚಿಕಿತ್ಸಾ ಶಿಬಿರಗಳನ್ನು ಮಾಡುತ್ತಿದ್ದೇನೆ. ವಿನಾಶದ ಹಂಚಿನಲ್ಲಿರುವ ಗಿಡಮೂಲಿಕೆ ಔಷಧಿ ಸಸ್ಯಗಳನ್ನು ಬೆಳೆಸಿ - ಉಳಿಸಿ - ಬಳಸಿ, ಹಲವು ರೋಗಗಳ ಮೇಲೆ ಪ್ರಭಾವಯುತವಾಗಿ ರೋಗ ಗುಣಪಡಿಸುವ ಗಿಡಮೂಲಿಕೆ ಔಷಧಿ ಸಸ್ಯಗಳ ಬಗ್ಗೆ ತಮ್ಮ ಮುಂದೆ ಮಾತನಾಡಲು ಇಚ್ಛಿಸುತ್ತೇನೆ. ಈ ಗಿಡಮೂಲಿಕೆಗಳನ್ನು ಅನೇಕ ರೋಗಗಳಿಗೆ ಕೊಟ್ಟು ರೋಗ ಗುಣಪಡಿಸಿರುತ್ತೇನೆ. ಈ ಅನುಭವವನ್ನು ತಮ್ಮ ಹತ್ತಿರ ಹಂಚಿಕೊಳ್ಳಲು ಇಚ್ಛಿಸುತ್ತೇನೆ.

೧) ಅಶ್ವಗಂಧ (ಹಿರೇಮದ್ದಿನ ಗಿಡ) (ವರ್ಣನೆ):-

ಇದು ಒಂದರಿಂದ ಮೂರು ಅಡಿ ಎತ್ತರಕ್ಕೆ ಬೆಳೆಯುತ್ತದೆ. ಎಲೆಗಳು ಬೂದು ಬಣ್ಣದ ರೋಮಗಳಿಂದ ಕೂಡಿರುವುದು, ಹಣ್ಣು ಕೆಂಪಾಗಿರುವುದು. ಇದರ ಎಲೆಗಳನ್ನು ಕೈಗಳಿಂದ ಉಜ್ಜಿದರೆ ಕುದುರೆ ಮೂತ್ರದ ವಾಸನೆ ಬರುವುದು. ಆದುದರಿಂದ ಈ ಮೂಲಿಕೆಗೆ ಅಶ್ವಗಂಧ ಎನ್ನುವರು. ಹಳ್ಳಿಗಾಡಿನಲ್ಲಿ ಗೊತ್ತಿಲ್ಲದ ವ್ಯಾಧಿ ಸರ್ವ ರೋಗಕ್ಕೆ ಮದ್ದು, ಹಿರೇ ಮದ್ದು, ಎಂಬುವ ವಾಡಿಕೆ ಮಾತು ರೂಢಿಯಲ್ಲಿದೆ.

ಸರಳ ಚಿಕಿತ್ಸೆ:-

ಎಲೆ, ಹಣ್ಣು ಬೇರು, ಈ ಅಶ್ವಗಂಧ ಗಿಡದ ಸಮೂಲವನ್ನು ಚಿಕಿತ್ಸೆಯಲ್ಲಿ ಉಪಯೋಗಿಸುವರು. ಬಹುಕಾಲದಿಂದಲೂ ಬಳಕೆಯಲ್ಲಿರುವ ಔಷಧಿ ಸಸ್ಯ. ಇದು ರಕ್ತ ಶುದ್ಧಿ ಮಾಡಿ, ರಕ್ತ ವೃದ್ಧಿ ಮಾಡಿ, ದೇಹಕ್ಕೆ ಕಾಂತಿ ಮತ್ತು ಪುಷ್ಟಿಯನ್ನು ಕೊಡುವುದು. ನಿಶ್ಯಕ್ತಿಯನ್ನು ನೀಗುವುದು ಹಾಗೂ ಮುಪ್ಪನ್ನು ಗಿಲ್ಲುವ ಶಕ್ತಿಯಿದೆ. ಈ ಅಶ್ವಗಂಧ ಗಿಡಮೂಲಿಕೆ ಸೇವನೆಯಿಂದ ಚಿತ್ತಚಂಚಲತೆ, ಗಾಬರಿ ದೂರವಾಗಿ ಮಕ್ಕಳಿಗೆ ಪುಷ್ಟಿ ನೀಡುವುದು. ವೃದ್ಧಾಪ್ಯದ ದೌರ್ಬಲ್ಯಗಳನ್ನು ಹೋಗಲಾಡಿಸಿ, ದೇಹಕ್ಕೆ ಶಕ್ತಿ ಮತ್ತು ಯೌವನವನ್ನು ಕೊಡುವುದು. ಈ ಅಶ್ವಗಂಧದ ಗಿಡದ ಬೇರನ್ನು ಹಾಲಿನೊಡನೆ ಬೇಯಿಸಿ ಶುದ್ಧಿ ಮಾಡಿ, ಹೊತ್ತಿಗೆ ೫ ಗ್ರಾಂ ನಷ್ಟು ಚೂರ್ಣವನ್ನು ದಿನಕ್ಕೆ ಎರಡು ವೇಳೆಯಂತೆ, ಸಕ್ಕರೆ ಮತ್ತು ಹಾಲಿನೊಡನೆ ಕುದಿಸಿ ಕುಡಿಯಬೇಕು.

೨) ಅಶ್ವತ್ಥ ಮರ (ಅರಳಿ ಮರ) ವರ್ಣನೆ :- ಅಶ್ವತ್ಥ ಮರವನ್ನು ದೈವ ಪ್ರತಿನಿಧಿ ಎಂದು ಭಾವಿಸಿ ಕಟ್ಟೆಯನ್ನು ಕಟ್ಟಿ ಬೆಳೆಸುತ್ತಾರೆ. ಪೂಜೆಯನ್ನು ಮಾಡುತ್ತಾರೆ. ಪವಿತ್ರ ಪೂಜಾ ವೃಕ್ಷ. ಇದರ ಎಲೆ ವಿಳೇದಲೆಯನ್ನು ಹೋಲುತ್ತವೆ. ಎಲೆ ಹೊಳಪಾಗಿದ್ದು, ನರಗಳು ಸ್ಪಷ್ಟವಾಗಿ ಕಾಣುತ್ತವೆ. ಎಳೆ ಎಲೆಯ ಕುಡಿಗಳು ತಿಳಿ ಕೆಂಪು ಬಣ್ಣವನ್ನು ಹೊಂದಿರುತ್ತದೆ. ಇದು ದೊಡ್ಡ ಮರ. ಕಾಯಿ ಹಸಿರಾಗಿದ್ದು, ಒಣಗಿದ ಮೇಲೆ ಕಂದು ವರ್ಣವನ್ನು ಹೊಂದುತ್ತವೆ. ಕಾಯಿಯ ತುಂಬಾ ಸಣ್ಣ-ಸಣ್ಣ ಬೀಜಗಳು ಇರುತ್ತವೆ. ಈ ಕಾಯಿಗಳನ್ನು ಹಕ್ಕಿ-ಪಕ್ಷಿಗಳು ತಿಂದು ತೃಪ್ತಿ ಪಡುತ್ತವೆ.

ಸರಳ ಚಿಕಿತ್ಸೆ (ದಾಂಪತ್ಯ ಸೌಖ್ಯ):- ಅರಳಿಮರದ ಒಳ ತಿರುಳು, ಪತ್ರ, ಕಾಯಿ, ಬೇರು, ಸಮತೂಕ ನೆರಳಲ್ಲಿ ಒಣಗಿಸಿ ವಸ್ತ್ರಗಳಿಗಿಂತ ಚೂರ್ಣ ಮಾಡುವುದು. ರಾತ್ರಿ ಮಲಗುವಾಗ ಕಾಯಿಸಿದ ಹಾಲು, ಕಲ್ಲು ಸಕ್ಕರೆಯೊಡನೆ ಸೇವಿಸುವುದು. ಈ ಚೂರ್ಣವು ಶಕ್ತಿದಾಯಕ ಮತ್ತು ದಾಂಪತ್ಯ ಸೌಖ್ಯವನ್ನು ಕೊಡುವುದು.

ಬೆಂಕಿ, ಎಣ್ಣೆ ಮತ್ತು ಬಿಸಿನೀರಿನ ಸುಟ್ಟ ಗಾಯಗಳಿಗೆ :- ಅರಳಿ ಮರದ ತೊಗಟೆಯ ನಯವಾದ ಚೂರ್ಣವನ್ನು ಗಾಯಗಳ ಮೇಲೆ ಸಿಂಪಡಿಸುವುದು ಹಾಗೂ ಕೊಬ್ಬರಿ ಎಣ್ಣೆ ಜೊತೆ ಬೇಲಿಔಡಲ ಮತ್ತು ಅರಳಿ ಮರದ ತೊಗಟೆಯ ಚೂರ್ಣವನ್ನು ಹಾಕಿ ಕುದಿಸಿ ತೈಲಮಾಡಿ ಲೇಪಿಸುವುದರಿಂದ ಸುಟ್ಟ ಗಾಯದ ಕಪ್ಪು ಕಲೆ ಇಲ್ಲದಂತೆ ಖಂಡಿತ ಗುಣವಾಗುವುದು.

ವಾಂತಿ ಮತ್ತು ಅತಿಸಾರ :- ಅಶ್ವತ್ಥದ ಚಕ್ಕೆ ಬೂದಿ ಒಂದು ಹಿಡಿಯನ್ನು ಒಂದು ಪಾವು ನೀರಿನೊಡನೆ ಮಿಶ್ರಣ ಮಾಡಿ ಸ್ವಲ್ಪ ಸಮಯದ ನಂತರ ಶೋಧಿಸಿ ಕುಡಿಸಿದರೆ ಅಸಾಧ್ಯ ವಾಂತಿ ಖಂಡಿತ ಗುಣ. ದ್ರವರೂಪದ ಮಲಸ್ರಾವಗಳಲ್ಲಿ ಅರಳಿ ಮರದ ಹಣ್ಣು ಅಥವಾ ತೊಗಟೆಯ ಕಶಾಯಗಳ ಸೇವನೆ ಮಾಡುತ್ತಾರೆ. ಈ ಕಶಾಯ ನಾಯಕಮೃನ್ನು ಗುಣಪಡಿಸುತ್ತದೆ.

ಸಂತಾನ ಫಲ :- ಮಕ್ಕಳಾಗದವರು ಅರಳಿ ಮರದ ಪ್ರದಕ್ಷಿಣೆ ಮಾಡುತ್ತಾರೆ. ಅರಳಿ ಮರದ ಹಣ್ಣಿನ ಚೂರ್ಣವು ಗರ್ಭಾಶಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ರೋಗಗಳನ್ನು ಕೂಡಲೇ ನಿವಾರಿಸಿ, ಆರೋಗ್ಯವಂತರಾದ ಮಕ್ಕಳನ್ನು ಪಡೆಯಲು ಕಾರಣವಾಗುತ್ತದೆ.

೩) ಪಾತಾಳ ಗರುಡನ ಗೆಡ್ಡೆ (ಗಿಣಿಮೂತಿ ಗೆಡ್ಡೆ) (ವರ್ಣನೆ) :- ಈ ಬಳ್ಳಿ ಬೇಲಿ ಪೊದೆಗಳ ಮೇಲೆ ಹಬ್ಬಿರುತ್ತದೆ. ಎಲೆ ಹಾಗಲಕಾಯಿ ಎಲೆಯಂತೆ ಚಿಕ್ಕ ಎಲೆಗಳು. ಹಣ್ಣು ಕೆಂಪು ಬಣ್ಣ. ಇದರ ಗೆಡ್ಡೆ ಹಾವಿನ ವಿಷ, ಸರ್ಪ ಸುತ್ತು, ಚರ್ಮರೋಗದ ಸೋರ್ಯಸಿಸ್, ಗಾಯ, ಗ್ಯಾಂಗ್ರೀನ್‌ಗಳಲ್ಲಿ ಬಳಸಬಹುದು. ಎಣ್ಣೆಯೊಡನೆ ಕುದಿಸಿ ಲೇಪಿಸಬಹುದು. ಈ ಗೆಡ್ಡೆಯನ್ನು ಸಣ್ಣ ಸಣ್ಣ ಚೂರುಗಳಾಗಿ ಮಾಡಿ ಒಣಗಿಸಿ, ಕುಟ್ಟಿ ಪೌಡರ್ ಮಾಡಿ, ಈ ಜೊತೆಗೆ ವಿಷಮುಷ್ಟಿ ಚಕ್ಕೆ ಪೌಡರ್ ಅನ್ನು ಸೇರಿಸಿ ಇಟ್ಟುಕೊಂಡು ಚಿಟಿಕೆ ಪ್ರಮಾಣ ದಿನಕ್ಕೆ ಎರಡು ಸಾರಿ ನಿಂಬೆರಸ ಅಥವಾ ಜೇನಿನೊಡನೆ ಕೊಟ್ಟರೆ ಹಾವಿನ ವಿಷ, ಸರ್ಪಸುತ್ತು, ಚರ್ಮರೋಗ ಖಂಡಿತ

ಗುಣವಾಗುತ್ತದೆ. ಬಹುಕಾಲದ ಗಾಯ, ಗ್ಯಾಂಗ್ರೀನ್‌ಗಳಿಗೆ ಎಣ್ಣೆಯೊಡನೆ ಕುದಿಸಿ, ಲೇಪಿಸುವುದರಿಂದ ತುರಿಕೆ, ಗಾಯ, ಗ್ಯಾರಂಟಿ ಗುಣವಾಗುತ್ತದೆ.

೪) ತೊರೆಮತ್ತಿ ಮರ (ಅರ್ಜುನ ಮರ) (ವಿವರಣೆ) :- ಅರ್ಜುನ ವೃಕ್ಷವು ಸುಮಾರು ೬೦-೮೦ ಅಡಿ ಬೆಳೆಯುತ್ತದೆ. ತೊಗಟೆ ಬಿಳಿಯಾಗಿದ್ದು, ಒಳಭಾಗದಲ್ಲಿ ಕೆಂಪು ಛಾಯೆಯಿಂದ ಕೂಡಿದೆ. ಬೇಸಿಗೆಯಲ್ಲಿ ಹೂ ಬಿಡುತ್ತದೆ. ಚಳಿಗಾಲದಲ್ಲಿ ಅಥವಾ ವಸಂತ ಋತು ಕಾಲದಲ್ಲಿ ಪಕ್ಷವಾದ ಫಲವನ್ನು ಹೊಂದುತ್ತದೆ. ಇದರ ತೊಗಟೆ ಒಗರು ರುಚಿಯಾಗಿದೆ. ಗುಡ್ಡಗಾಡುಗಳಲ್ಲಿ ಕೇಳುವವರಿಲ್ಲದೆ ನಾಶವಾಗುತ್ತಿರುವ ತೊರೆಮತ್ತಿಯಲ್ಲಿ ಹೃದಯ ಪೋಷಣೆಗೆ ಅಗತ್ಯವಾದ ಘಟಕಗಳಿವೆ.

ಸರಳ ಚಿಕಿತ್ಸೆ :- ಮೂಳೆ ಮುರಿತ ಉಂಟಾದಾಗ ಇದರ ತೊಗಟೆ ಪೌಡರ್ ಅರ್ಧ ಚಮಚವನ್ನು ಹಾಲಿನೊಡನೆ ಕುದಿಸಿ ಕುಡಿಸಿಬೇಕು ದಿನಕ್ಕೆ ಎರಡು ಬಾರಿ ಗುಣವಾಗುವವರೆಗೆ.

ಧಮ್ಮು, ಕೆಮ್ಮು ಇದ್ದಾಗ :- ಅರ್ಜುನ ತೊಗಟೆ ಪುಡಿ ಅರ್ಧ ಚಮಚ ಮತ್ತು ಆಡುಸೋಗೆ ಸೊಪ್ಪಿನ ಪೌಡರು ಅರ್ಧ ಚಮಚ ನೀರಿನೊಡನೆ ಕುದಿಸಿ, ದಿನಕ್ಕೆ ಎರಡು ಬಾರಿ ಗುಣವಾಗುವವರೆಗೆ ಕುಡಿಸಬೇಕು.

ಹೃದಯ ರೋಗಕ್ಕೆ ಹಿತಕಾರಿ :- ಅರ್ಜುನ ತೊಗಟೆ ಕಫ, ಪಿತ್ತ, ಮೊದಲಾದವುಗಳನ್ನು ನಿವಾರಿಸುತ್ತದೆ. ರಕ್ತದ ಒತ್ತಡ ಕಡಿಮೆಯಾಗಿ ಉಂಟಾಗುವ ಹೃದಯ ದೌರ್ಬಲ್ಯದಲ್ಲಿಯೂ ಹಾಗೂ ರಕ್ತದ ಒತ್ತಡ ಹೆಚ್ಚಾಗಿ ಉಂಟಾಗುವ ಸ್ವಂದನವು ಸಮರ್ಪಕವಾದ ರೀತಿಯಲ್ಲಾಗುವಂತೆ ನೋಡಿಕೊಳ್ಳುವ ಅರ್ಜುನ ಮರದ ತೊಗಟೆಯ ಚೂರ್ಣವು ಮಹತ್ವವಾದ ಔಷಧಿ ಗುಣವನ್ನು ಹೊಂದಿದೆ.

೫) ಶಂಖಪುಷ್ಪಿ (ವರ್ಣನೆ) :- ಈ ಮೂಲಿಕೆ ಬೇಲಿ ಮತ್ತು ಪೊದೆಗಳ ಮೇಲೆ ಸುತ್ತು ಬಳ್ಳಿಯಾಗಿ ಬೆಳೆಯುತ್ತದೆ. ಹೂವು ನೀಲಿ ಅಥವಾ ಬಿಳಿ ಬಣ್ಣವನ್ನು ಹೊಂದಿರುತ್ತದೆ. ದೋಣಿಯಾಕಾರದಲ್ಲಿ ಕಾಣುತ್ತದೆ. ಸೆಪ್ಟೆಂಬರ್, ನವೆಂಬರ್ ತಿಂಗಳಲ್ಲಿ ಹೂ-ಕಾಯಿ ಬಿಡುತ್ತದೆ.

ಸರಳ ಚಿಕಿತ್ಸೆ :- ಬುದ್ಧಿವರ್ಧಕ, ಶಕ್ತಿವರ್ಧಕ, ಸ್ವರ ಉತ್ತಮ ಪಡಿಸಲು ನರಸಂಬಂಧ ಲಕ್ಷ ರೋಗಗಳನ್ನು ಗುಣಪಡಿಸಲು ಶಂಖಪುಷ್ಪಿ ಸಮೂಲ ಚೂರ್ಣ ಒಂದು ಭಾಗ, ಬ್ರಾಹ್ಮೀ (ಒಂದೇಲಗ), ಒಂದು ಭಾಗ, ಜೇಷ್ಠ ಮಧು ಚೂರ್ಣ ಒಂದು ಭಾಗ, ಅಕಲಕರ ಒಂದು ಭಾಗ, ಈ ಎಲ್ಲಾ ಚೂರ್ಣಗಳನ್ನು ಸಮಭಾಗ ಸೇರಿಸಿ, ತುಪ್ಪ ಮತ್ತು ಜೇನಿನೊಡನೆ ಲೇಹ್ಯ ಮಾಡಿ ಉಪಯೋಗಿಸಬೇಕು. ವೃದ್ಧಾಪ್ಯದಲ್ಲಿ ನೆನಪಿನ ಶಕ್ತಿ ಕೊಡುವ ಈ ಶಂಖಪುಷ್ಪಿ ಗಿಡಮೂಲಿಕೆ ಬಹಳ ಮಹತ್ವವಾದದ್ದು.

೬) ಬೂರುಗದ ಮರ (ಶಾಲ್ಮಿಲೀ) (ವರ್ಣನೆ) :- ಈ ಮರವು ಸುಮಾರು ೧೦೦ – ೧೨೦ ಅಡಿಗಳು ಎತ್ತರವಾಗಿ ಬೆಳೆಯುತ್ತದೆ. ಮುಳ್ಳುಗಳಿಂದ ಕೂಡಿರುವ ಮರ ಕೆಂಪು ಹೂವಿನ ಬೂರುಗದ ಮರವು ಹೆಚ್ಚು ಔಷಧಿ ಗುಣವನ್ನು ಹೊಂದಿರುತ್ತದೆ. ಇದರ ಎಲೆ ಐದು – ಏಳು ಪತ್ರಕಗಳಿದ್ದು, ಹೊಳೆಯುವ ಹಸಿರು ವರ್ಣದಲ್ಲಿರುತ್ತದೆ. ಹೂ, ಕಾಯಿ, ತೊಗಟೆ ಇವನ್ನೆಲ್ಲಾ ಚಿಕಿತ್ಸೆಗಾಗಿ ಉಪಯೋಗಿಸುತ್ತಾರೆ.

ಸರಳ ಚಿಕಿತ್ಸೆ :- ಈ ಮರದ ತೊಗಟೆಯ ವಸ್ತ್ರಗಾಳಿತ ಪುಡಿಯನ್ನು ಹಾಲಿನೊಡನೆ ಸೇವಿಸುವುದರಿಂದ, ಮೂತ್ರ ಮಾಡುವಾಗ, ಉರಿ, ನೋವು, ಅತ್ಯಪ್ಪಿ, ಹಾಗೂ ಕಿಡ್ನಿಗೆ ಸಂಬಂಧಿಸಿದ ಖಾಯಿಲೆಗಳಿಗೆ ಪ್ರಭಾವಶಾಲಿ ಗಿಡಮೂಲಿಕೆ ಔಷಧಿ ಗುಣವನ್ನು ಹೊಂದಿದೆ. ಸ್ತ್ರೀಯರ ರಕ್ತಪದರಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಹಲವು ಖಾಯಿಲೆಗಳು ಗುಣವಾಗುತ್ತವೆ.

ಪಶು ಅತಿಸಾರ ರೋಗಕ್ಕೆ :- ಪಶು ಪ್ರಾಣಿಗಳಿಗೆ ಮೊದಲು ಬೇದಿ ಕಾಣಿಸಿಕೊಳ್ಳುತ್ತದೆ. ಬೇದಿ ನಿಲ್ಲಲು ಸರಿಯಾದ ಚಿಕಿತ್ಸೆ ಮಾಡದಿದ್ದಾಗ ರಕ್ತ ಬೇಧಿಯಾಗಿ ಕಾಣಿಸುವುದು. ನಂತರ ಗಂಟು-ಗಂಟು ರಕ್ತ ಬೇಧಿಯಾಗುವುದು. ಎತ್ತು, ಹಸು, ಎಮ್ಮೆ ಯಾವುದೇ ಆಗಲೀ ಮೇಲೆ ಎದ್ದು ನಿಲ್ಲುವ ನಿಶ್ಯಕ್ತಿ ಇಲ್ಲದ ಪರಿಸ್ಥಿತಿಗೆ ಬರುವುದು. ಆಗ ಪಶು ವೈದ್ಯರು ಬಂದು ಗ್ರೂಕೋಸ್ ಬಾಟ್ಲಿ ಹಾಕಿದರೂ ಬೇದಿ ನಿಲ್ಲದೇ ಜೀವ ಹೋಗುವ ಪರಿಸ್ಥಿತಿಯಲ್ಲಿ ಪಶು ತಲೆ ನೆಲಕ್ಕೆ ಹಾಕಿ ಮಲಗುವುದು. ಆಗ ಈ ಬೂರುಗದ ಮರದ ತೊಗಟೆಯನ್ನು ಮಜ್ಜಿಗೆಯೊಡನೆ ರುಬ್ಬಿ ಒಂದು ಸೇರು ರಸ ಹಿಂಡಿಕೊಂಡು ಕೊಟ್ಟದಲ್ಲಿ ದಿನಕ್ಕೆ ಮೂರು ವೇಳೆ ಹೊಟ್ಟೆಗೆ ಕುಡಿಸಿ, ಪಶು ಎದ್ದು ನಿಲ್ಲುವುದು. ಪಶು, ಪ್ರಾಣಿಗಳಾದಂತಹ ಹಸು, ಎತ್ತು ಎಮ್ಮೆ ಇನ್ನು ಮುಂತಾದ ಪ್ರಾಣಿಗಳ ಅತಿಸಾರ ಗ್ಯಾರಂಟಿ ಗುಣಮಾಡಿ, ಪುಣ್ಯ ಕಟ್ಟಿಕೊಳ್ಳಬೇಕಾಗಿ ಪ್ರಾರ್ಥನೆ.

ಈ ಗಿಡಮೂಲಿಕೆ ಔಷಧಿ ಸಸ್ಯಗಳು ಜನರ ಅಜ್ಞಾನದಿಂದಲೋ ಅಥವಾ ನಾಟಿ ವೈದ್ಯರ ಹೆಸರು ಹೇಳಿಕೊಂಡು ಯಾವುದಾದರೂ ಸಂಸ್ಥೆ ಪ್ರತಿ ವರ್ಷ ಹಣ ದೋಚಿ, ದುರುಪಯೋಗ ಮಾಡಿರುವುದರಿಂದಲೋ ಅಥವಾ ಸಹಾಯ ಹಸ್ತಗಳ ಕೊರತೆಯಿಂದಲೋ ಇಡಮೂಲಿಕೆ ಔಷಧಿ ಸಸ್ಯಗಳು ವಿನಾಶದ ಹಂಚಿನಲ್ಲಿವೆ. ಈ ಬಗ್ಗೆ ಫನ ಸರ್ಕಾರವರು ಪತ್ತೆ ಹಚ್ಚಿ ಸೂಕ್ತ ಕ್ರಮ ತೆಗೆದುಕೊಳ್ಳಬೇಕು. ಸರ್ಕಾರಕ್ಕೆ ಮನವಿ ಮಾಡಿಕೊಳ್ಳುವುದೇನೆಂದರೆ, ದಯವಿಟ್ಟು ಸಾಕಷ್ಟು ಹಣವನ್ನು ಇದಕ್ಕೆ ಮೀಸಲಾಗಿಟ್ಟು, ಔಷಧಿ ಸಸ್ಯಗಳನ್ನು ಆಸಕ್ತಿಯುಳ್ಳ ಜನರು ಮತ್ತು ನಾಟಿ ವೈದ್ಯರು ಬೆಳೆಸಿ-ಉಳಿಸಿ-ಬಳಸುವಂತಾಗಲು ನೇರ ಸಂಪರ್ಕವಾಗಿ ಮಾತನಾಡಿ ಪ್ರೋತ್ಸಾಹಿಸಬೇಕೆಂದು ವಿನಂತಿಸಿಕೊಳ್ಳುತ್ತೇನೆ.

DOCUMENTATION, APPLICATION AND ASSIMILATION OF TRADITIONAL KNOWLEDGE FOR SUSTAINABLE HARVESTING OF NTFPS/MEDICINAL PLANTS

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Abstract

This paper focuses on documentation, application and assimilation of traditional knowledge on medicinal plants/ NTFPs at two study sites namely Savandurga and Agumbe in Karnataka. It describes the process of documentation of traditional knowledge with respect to six species adopted for the study on developing methodology for sustainable harvesting of medicinal plants/ NTFPs. Various methods have been developed to document traditional and scientific knowledge information from local people to prepare site and species profile. It comprises ecology of species, harvesting patterns, trade and local use of species. Further participatory steps have been prepared for application of biometric protocols at two study sites.

Keywords: Application, Assimilation, modern scientific knowledge, participatory steps, species profile, Sustainable harvesting, Traditional knowledge

1. BACKGROUND

Traditional knowledge means knowledge, innovations and practices of indigenous and local communities embodying traditional life-styles; the wisdom developed over many generations of holistic traditional scientific utilization of the lands, natural resources, and environment. It is generally passed down by word of mouth, from generation to generation and still undocumented. Traditional knowledge is valid and important, and has relevant wider application for human benefit. An understanding of traditional knowledge and how it differs from non-traditional knowledge is an important basis for determining how to use it. Knowing what it contains and how it is acquired and held is fundamental to being able to make good use of the knowledge and to encourage all parties to be aware of the added value its use will bring.

Design and development of participatory management envisages documentation of traditional knowledge and more importantly enhance its understanding and swap with modern science for its better application and assimilation This paper describes the process of documentation of traditional knowledge with respect to six species adopted for the study on

developing methodology for sustainable harvesting of medicinal plants/ NTFPs at two study sites namely Savanadurga and Agumbe in Karnataka. The local communities define the traditional knowledge as their way of life and such elements have been documented and summarized in the Box 1. This paper also elaborates on different methods used for documentation of traditional knowledge related to building location and species profiles, medicinal values and traditional uses, harvesting patterns and processing etc.

Box 1. Traditional Knowledge – is a way of life

- ✍ It is practical common sense. Based on teachings and experiences passed on from generation to generation.*
- ✍ It is holistic. It cannot be compartmentalized and cannot be separated from the people, who hold it. It is rooted in the spiritual health, culture and language of the people.*
- ✍ Traditional knowledge is an authority system. It sets out the rules governing the use of resources - respect, an obligation to share. It is dynamic, cumulative and stable.*
- ✍ Traditional knowledge is a way of life -wisdom is using it in good ways.*
- ✍ It gives credibility to the people and their relationship with nature.*

2. DOCUMENTATION OF TRADITIONAL KNOWLEDGE

Traditional knowledge, which is centered on tested beliefs, practices and traditional technologies, needs to be documented through systematic and planned approach. Documentation of such Knowledge through established protocols may be the primary requirement. The efforts of community, individual and public domain knowledge systems in creating the database and documentation of traditional knowledge systems should be strengthened. Under participatory management of natural resources, documentation, assimilation and its application into management practices is essential. In this context ten steps are described as below;

- ✍ Design and development of participatory methods for systematic documentation of traditional knowledge, such as Participatory Rural Appraisal, Rapid Assessment and Appraisal, Farming system and appraisal, Social Matrix and Index, Criteria and Indicator method. Application of any of these methods needs customisation and adaptation to local conditions and should have scope to document spatial and time series information from different stakeholder groups.*
- ✍ Identification of stakeholder group/s, which are relevant to location and resource for which documentation is planned.*
- ✍ Decision on location, resources and duration for the documentation process.*
- ✍ Application of more than one method with pre-trained resource persons.*
- ✍ Integration of traditional knowledge and modern scientific knowledge, and its assimilation into participatory management practices.*
- ✍ Development of participatory steps, which emerge from integration of traditional knowledge and modern knowledge for long term monitoring.*
- ✍ Generation of results through experimentation and monitoring*
- ✍ Dissemination and discussion with relevant stakeholder group/s for their acceptance and application of wise practices into general practice*

✎ Assimilation of adaptive management practices into forest management plans.

3. METHODS FOR DOCUMENTATION, APPLICATION AND ASSIMILATION OF TRADITIONAL KNOWLEDGE

Several methods were adopted for documentation of traditional knowledge and preparation of participatory management in two study sites namely Agume (evergreen forest) and Savandurga (dry deciduous forest) in Karnataka state of India. They include Participatory Rural Appraisal (PRA); Stakeholders meetings; Community workshop and Social Matrix and indicator development. Each method is modified to the context of study and issues targeted in respect of each method to cater the advantages of structure of such are also discussed. Further, each method is interlinked as they are varied in depth and extent in documenting the traditional knowledge from different stakeholder groups in the village.

3.1. Participatory rural appraisal

Participatory Rural Appraisal (PRA) is a participatory research method that involves the community in planning of communication programme. PRA helps to identify, define, and prioritize the needs and problems of the people and evolve opportunities and solutions. It may also help to identify the stakeholders. As a communication research method, PRA also identifies the traditional and modern communication systems in the community to be used for interacting with the people during programme implementation. PRA method was used for building village profile, comprising demographic information, cultural and historical identity of village, resource status and its use. It was also used to build species profile, which details about description, local distribution, phenology, medicinal property and uses, propagation method/s, local trade and processing and harvesting patterns. The broad issues covered under PRA were scrutinized during the stakeholder meetings through detailed discussion and documentation.

3.2. Stakeholder meetings

The stakeholder meetings were designed and organized in sequence with PRA, to document specific knowledge with respective stakeholder groups identified in the village. This enabled us to interact with each stakeholder group and solicit their needs and concerns about resources, and involve them in the development of a framework for participatory management and benefit sharing. The two key steps in organizing the stakeholder meetings at village level were; identification of all possible stakeholder groups in the village followed by classification of stakeholders into primary and secondary based on the extent of dependence on the forest resources. The primary stakeholder groups such as NTFP collectors, VFC members, local NTFP traders and agents and Nati Vidyas (folk healers) are directly connected with resources as they use resources for their health and livelihood security. In this context they have special concern towards conservation and sustainable utilization of resources. The secondary stakeholder groups such as self-help groups, village level NTFP

Box 2. Stakeholder groups and issues focused on documentation

Stake holder group	Issues focused for documentation of traditional knowledge
NTFP collectors	Distribution and ecology of species, Patten of harvest, season of harvest, conservation and regeneration of species, value addition, self consumption and trade
VFC members	Ecology of species, Protection, conservation and regeneration of species, management plans, trade and processing of NTFPs

Nati Vaidyas (folk healers)	Medicinal properties, medicinal value, ecology of species, collection practices, self consumption and trade, processing, time of harvest
Self help group members	Procurement and Processing, medicinal value, local and regional trade
Local Traders	Distribution and season of collection, quantity estimation, pricing, marketing channels and value addition

traders, panchayat and Forest Department, local NGOs etc. have concern over resources as they are duty bound or depend on the resources either for their economic or ecological benefits. The different stakeholder groups identified at the study sites and issues focused on documentation of traditional knowledge are given in the Box 2.

3.3. Community workshops

Community workshops need to be organized to document and consolidate the knowledge derived from PRA and stakeholder meetings at frequent intervals. The purpose of community workshop is to validate the knowledge and process the information for participatory planning for development of sustainable harvesting methodology. It requires a larger gathering, where discussion and approval of traditional knowledge and practices can happen. In the workshop, participation of different stakeholders such as local political leaders, traditional healers, traders and medicinal plant collectors should be ensured to have the participatory decision, which influences adaptive management at village level. The focus of community workshops conducted at study sites was to provide application and assimilation of traditional knowledge and initiate skill oriented training for community members on design and development of participatory and biometric protocols, and its implementation at filed.

3.4 Social matrix and index development

Development of social matrix and indexing method is used for documentation, application and assimilation of traditional knowledge with task team constituted for planning and monitoring of methodology in the village. The task team constituted with members from various stakeholder groups has special knowledge and skills about the resources. In this method, matrix has been developed based on the key indicators identified and measured for their social relevance. The issues addressed for development of matrix and indexes are as follows;

- ✎ Forest dependence and livelihood- Extent of forest dependence for health and livelihood security was measured based on four indicators such as extent of dependence, use, livelihood and conservation of various resources such as fuel wood, fodder, timber and small poles, medicinal plants, wet and dry leaves and NTFPs.
- ✎ Factors contributing to conservation and species regeneration- Major and sub factors responsible for conservation and regeneration of species were classified into environment related parameters such as soil, rainfall and temperature, and plant related such as girth, branches, shade, height, flowering and fruiting time.
- ✎ Documentation of traditional healers and their dependence on medicinal plants: the indicators are number of traditional healers in the village, their specialization, number of medicinal plant resources they use, part/s used, source and pattern of collection.

- ✎ Medicinal value- Local and medicinal uses of the selected species, economic and social relevance of the species in the region. The Table 1 describes the indicators and matrix developed for documentation traditional knowledge related to species.

Ranking of the species based on the effectiveness of the species in terms of medicinal value and use has been assessed by scoring the species on individual indicators and matrix. The details about medicinal use and part/s used as medicine, number of folk healers, number of diseases and effectiveness, method of formulation, collection pattern and by whom were documented.

4. PROCESS OF DOCUMENTATION, APPLICATION AND ASSIMILATION OF TRADITIONAL KNOWLEDGE

The documented traditional knowledge on various issues have been put into application under participatory framework for assimilation of such good practices into general practice after validating through rigorous monitoring from the local community. This section provides details about various issues attempted for documentation, followed by development of participatory steps for application and assimilation of traditional knowledge into forest management at the village level.

4.1. Development of village profile with social mapping

The village profile for two study sites namely Savandurga and Agumbe was prepared through PRA method after documenting the traditional knowledge from local community (Table 2). Social profiling of the study villages is necessary to assess the extent of dependence on the species, and also to decipher the proportion of different stakeholders in the villages. Information related to socio-economic development and natural resource management of the village was also documented. This information was used to design training and capacity building programme for local communities at two study sites.

4.2. Development of species profile

In order to develop species profile, stakeholder meetings were organized at two study sites. Key stakeholders at village level involved in the process of documenting the traditional knowledge were NTFP collectors, VFC members, Nati vaidyas/folk healers, self-help group members and local traders. Using PRAs and stakeholders meetings, species profiles for six species, three in Savandurga and three in Agumbe are developed. Location wise species profiles were created based on eight parameters, which contribute towards the conservation and sustainable utilization of species in the region. Scientific knowledge available regarding eight parameters was documented to enhance the application of such traditional knowledge into participatory management. Further, two knowledge systems were merged to prepare participatory steps for planning and development of methodology for sustainable harvesting of selected species. The detailed species profiles are given in the Appendix 1-6.

Species in Savanadurga: Savanadurga represents dry deciduous forest, with scrubby and thorny nature of vegetation. Three species namely *Decalepis hamiltonii*, *Limonia acidissima* and *Gymnema sylvestre* were selected for the study and species profiles were developed.

Species in Agumbe: Agumbe with every green forest is located in Western Ghats of Karnataka. Three species were selected for development of species profiles namely *Cinnamomum* spp., *Garcinia gummi-gutta* and *Vateria indica*.

4.3 Development of participatory steps

Development of participatory steps requires merger of both traditional and modern knowledge. It enables implementation of participatory experimentation and monitoring by

local communities. This study has developed participatory steps for application of participatory and biometric protocols for implementation of methodology for sustainable harvesting of NTFPs/medical plants. The participatory steps developed are; enumeration and sampling yield measurement, analytical methods and market survey. The methods followed for deriving participatory steps are documentation of biometric protocols from scientific literature. Table 3 provides participatory steps designed for various parameters.

4.4. Medicinal profile of selected species

By using social matrix and indexing method, medicinal profiles of the selected study sites and species were prepared. The process of documentation of medicinal profile starts with recording the biodiversity value and local significance of the forest, medicinal values of forests with species of local importance. The various index used and matrix developed are given in Table 4 to 11.

In Savandurga, medicinal plants are the major subsistence source from the forest for local people followed by fuel & fodder (Table 4). Green and dry leaves are collected in small quantity from the forest. Among four selected species, *Limonia acidissima* topped in all socio-economic parameters such as usage, subsistence, economics and employment (Table 5). *Azadirachta indica* was graded very high for its medicinal uses, economics and employmental benefits. Various medicinal uses and its related issues were documented from the local people (Table 6). Medicinal plants are rated for their uses, quantities required, efficacy and kind of diseases. The medicinal usage of *Azadirachta indica* (Neem) was high due to its high medicinal value, high efficiency, and more number of diseases it can cure. Following that, *Limonia acidissima* and *Gymnema sylvestre* were used highly for their high medicinal properties and efficacy in curing the diseases. The species-wise details of parts used, curable diseases, form it is being used and its efficacy are documented (Table 7).

In Agumbe, out of three selected medicinal plants, two species of *Cinnamomum* have high medicinal value, efficacy and offer cure for more diseases than *Garcinia gummi-gutta* and *Vateria indica* (Table 8). Species-wise details are given in Table 9. Nati vaidyas use *Cinnamomum* spp. in the form of oil extracted from its bark, root, leaf and bud Table 10. Many vaidyas collect oil from seed and fruits of *Garcinia gummi-gutta*. The constraints for conservation and regeneration of selected species in Agumbe are discussed (Table 11).

5. LESSONS LEARNT

The above efforts of documenting, applying and assimilating the traditional knowledge in tandem with the technical knowledge have clearly brought out the difficulties involved. While these two knowledge systems, traditional and modern, have their own strengths, they seem to be intrinsically not easily miscible. The modern scientific knowledge is well documented and chronologically organized through reviews and publication. Similar way, the traditional knowledge system has strong flow in the form of practices from generation to generation through oral transmission. Growth and transmission, blending and assimilation of such diverse nature of knowledge streams can become possible only with great efforts.

Table 1. Various social matrix and index for documentation of traditional knowledge

Indicators	Matrix (scores are assigned in the ascending order from 1 to three)		
	1	2	3
<i>Forest dependence and use</i>			
Dependence	One of the sources	Alternative source	Only one source
Spread of use	Outside trading	Local trading	House-hold use
Potential for livelihood generation	Commercial	Extra income	Self consumption
Conservation (biodiversity , ecosystem and medicinal value)	One of the three	Two of the three	All the three
<i>Medicinal use and effectiveness</i>			
Local use	Used in trade	Used as food	Used as medicine
Number of diseases cured	One disease	2 to 5 diseases	More than five disease
Part/s used as medicine	One part	2 to 3 parts	More than 3 or whole plant
Effectiveness as medicine	Used with many plants	Used with few plants	Single plant used
Nature of disease	Primary diseases	Secondary diseases	Chronic and deadly diseases

Table 2. Social profile of the two study sites, Savandurga and Agumbe in Karnataka, India

Parameters	Information documented
Demography	Number of households, population, ethnic composition
History and culture	Village history, cultural heritage, festivals and special occupations of the village
Socio-economy	Literacy status, education facilities, institutional and organizational facilities in the village
Natural resources	Water resources, land use pattern, cropping pattern, livestock holding
Forest resources and management	Type of forest and vegetation, forest resources collected and used, area under forest, JFM details, VFC details

Table 3. Biometric and participatory steps in developing the methodology for sustainable harvesting of Medicinal plants/NTFPs

<u>Parameter/ Approach</u>	Biometric steps		Participatory steps	
Enumeration (Stock Sampling)				
<u>Plot Selection</u>	<u>Choosing Random numbers from the Table / lentil throwing on Cartographic map</u>		<u>Throwing pebbles on the map, showing landmarks on the ground by the task team members</u>	
<u>Layout</u>	<u>Geographic Information System and Global Positioning System</u>		<u>Referring to landmarks such as Road, rivers, rocks etc.</u>	
<u>Yield Measurement (Treatment wise)</u>				
Treatment	Business Usual	As Test harvest	Reckless harvest	<u>Proper harvest</u>
<u>Harvest timing</u>	=	=	<u>One visit/time harvest before maturity</u>	<u>2 – 3 visits/times with in harvest period</u>
Harvest method	-	-	<u>Damaging the plant harvested (eg: cutting the branches for harvesting fruit)</u>	<u>Causing no damage to the plant (eg: plucking only the fruit)</u>
<u>Quantity</u>	<u>Maximum quantity</u>	<u>Some are un-harvested</u>	<u>Harvest everything, as much possible</u>	<u>Harvest only the ripe/mature produce</u>
<u>Analytical Methods</u>				
<u>Hypothesis</u>	<u>Definitive, precise wording</u>		<u>Cautious, flexible and accommodative</u>	
<u>Tool</u>	<u>Count, numerical data are used</u>		<u>Logical inference is drawn from long term observations</u>	
<u>Method</u>	<u>Theoretical</u>		<u>Practical</u>	
<u>Market Survey</u>				
<u>Yield quantity</u>	<u>Measurement by weight, number, length, counting</u>		<u>Visual estimation</u>	
<u>Price survey</u>	<u>Actual price or index is used</u>		<u>Alternative valuation is followed where market is not accessible</u>	

Table 4. Importance of forest and its subsistence use in Savandurga in Karnataka, India

Forest use	Dependence	Use	Livelihood	Conservation	Grade
Fuel and Fodder	3	3	3	1	10
Timber and small timber	2	2	2	2	8
Medicinal plants	2	3	3	3	11
Green and dry leaves	1	1	-	-	2

NTFPs	3	1	2	2	8
Environmental protection	3	1	3	1	8

Table 5. Socio-economic relevance of selected medicinal plants in Savandurga in Karnataka, India

Species	Use	Subsistence	Economics	Employment	Grade
<i>Gymnema sylvestre</i>	3	2	1	1	7
<i>Limonia acidissima</i>	2	3	3	3	11
<i>Decalepis hamiltonii</i>	1	1	2	2	6
<i>Azadirachta indica</i>	3	2	2	2	9

Table 6. Medicinal uses of selected species in Savanadurga in Karnataka, India

Species	Use	# of diseases	Proportion	Effect	Kind of disease	Grade
<i>Gymnema sylvestre</i>	3	1	1	2	3	10
<i>Limonia acidissima</i>	3	2	3	2	1	11
<i>Decalepis hamiltonii</i>	1	1	2	1	1	6
<i>Azadirachta indica</i>	3	3	3	3	3	15

Table 7. Medicinal profile for the selected species in Savanadurga in Karnataka, India

Species	Disease	Part of use	Methodology	Effect
<i>G. sylvestre</i>	<ul style="list-style-type: none"> ➤ Diabetes ➤ Eye of cattle 	Leaf	<ul style="list-style-type: none"> ➤ Powder ➤ Crush and put juice in to eyes 	<ul style="list-style-type: none"> ➤ Little cure ➤ <i>Full cure</i>
<i>L. acidissima</i>	<ul style="list-style-type: none"> ➤ Pitha (acidity) ➤ Gastric problems ➤ Blood purification 	Root	<ul style="list-style-type: none"> ➤ Pickle ➤ Decoction ➤ Powder 	Good cure
<i>D. hamiltonii</i>	<ul style="list-style-type: none"> ➤ Skin Disease ➤ Body heat ➤ Dysentery (children) ➤ Joint pain ➤ Allergy 	<ul style="list-style-type: none"> ➤ Bark ➤ Fruit ➤ Rind ➤ Seed ➤ Leaf + bark 	<ul style="list-style-type: none"> ➤ Powder ➤ Juice ➤ Juice ➤ Powder or as it is ➤ Mix and eat 	Good cure
<i>A. indica</i>	Fever	<ul style="list-style-type: none"> ➤ Bark ➤ Leaf 	<ul style="list-style-type: none"> ➤ Decoction (boiled) ➤ Apply juice 	Good cure

	Body itching Wound Ear disease Diabetes Teeth cleaning	<ul style="list-style-type: none"> ➤ Seed oil ➤ Young seedlings ➤ Twig/stem cuttings 	<ul style="list-style-type: none"> ➤ Apply juice ➤ Put juice into ear ➤ Eat just emerged seedling ➤ Use as brush with stick 	
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Table 8. Medicinal matrix of selected species in Agumbe in Karnataka, India

Species	<u>How Many disease</u>	Proportion	Effect	Diseases	<u>Grade</u>
<i>Cinnamomum</i> spp.	3	3	3	3	12
<i>Garcinia gummi-gutta</i>	2	2	2	2	8
<i>Vateria indica</i>	1	2	1	1	5

Table 9. Medicinal profile for the selected species in Agumbe in Karnataka, India

Species	Disease	Part used	Method of use
1. <i>Cinnamomum</i> spp.	<ul style="list-style-type: none"> ➤ Scab (Kajji) ➤ Teeth ache 	<ul style="list-style-type: none"> ➤ Bark ➤ Bark ➤ Root 	<ul style="list-style-type: none"> ➤ Bark oil, 2 times daily ➤ Apply powder ➤ Alale Mixed with solution of Hedduembe (<i>Leucas indica</i>) and Kanch huli (<i>Atalantia monophylla</i>) apply for one week. ➤ Used in Preparation of Decoction
2. <i>Garcinia gummi-gutta</i>	<ul style="list-style-type: none"> ➤ Throat pain ➤ Cattle diseases ➤ Wounds 	<ul style="list-style-type: none"> ➤ Fruit ➤ Bark 	<ul style="list-style-type: none"> ➤ Juice along with lime is used for curing throat pain ➤ Used in curing cattle disease (for cold) ➤ Bark boiled with coconut oil and used
3. <i>Vateria indica</i>	<ul style="list-style-type: none"> ➤ Cold ➤ Skin disease 	<ul style="list-style-type: none"> ➤ Gum ➤ Bark 	<ul style="list-style-type: none"> ➤ Smoke of the gum prevents cold ➤ Bark juice and fruit cures skin disease (Isibu)

Table 10. Medicinal uses of selected species in Agumbe in Karnataka, India

Species	# Nati vaidyas	Parts used	Collection	Preparation of medicine
<i>Cinnamomum</i> spp.	10	Bark, Root, Leaf, bud	<u>Self</u>	<u>Oil</u>
<i>Garcinia gummi-gutta</i>	5	Seed, Bark, fruit	Self	Oil,
<i>Vateria indica</i>	1	Bark, Gum	Self	Gum, Oil

Table 11. Factors that contribute towards conservation and regeneration of selected species in Agumbe in Karnataka, India

Species	Environmental factors			Vegetative factors					
	Soil	Temperature	Rain	Girth	Ht	Branch	Shade	Flower bearing	Fruit bearing
<i>Cinnamomum</i> spp.	X	√	X	√	√	√	X	√	√
<i>Garcinia gummi-gutta</i>	√	√	√	√	√	√	√	√	√
<i>Vateria indica</i>	√	√	√	X	X	X	√	√	√

APPENDIX 1. Species profile of *Decalepis hamiltonii*

Particulars	Scientific knowledge	Traditional knowledge
Location	Savanadurga (dry deciduous forest)	
Name of species	<i>Decalepis hamiltonii</i>	Makali Beru, Magadi beru
Distribution	Endemic to Deccan peninsula. Common in open rocky slopes and rocky cervices of dry to moist deciduous forests in Eastern Ghats in Andhra Pradesh, Karnataka and Tamil Nadu; Altitude ranges from 300 to 1200m.	Common along steep slopes especially rocky and barren area
Phenology	Leaf fall during January; Leafing from February-April; Flowering during January-February and fruiting in March-April.	Flowering in November-December; fruiting during January-March, New roots during February-April.
Climate and Productivity	-----	Yield: 2-3 kg roots per adult plant, often in soil substrate
Animal interaction	Wild animals feed on the roots	Insect pollinated; Wild boars eat roots
Regeneration/propagation	Propagated by seeds, stem cuttings and root suckers, but hardly cultivated.	Winged seeds, dispersed far away by wind.
Cultural relevance (Uses)	Used to prepare refreshing drinks. Roots are used to cure indigestion, dysentery, cough, bronchitis, leucorrhoea, uterine hemorrhage, skin diseases, fever, thirst, vomiting, poisoning, chronic rheumatism, anemia, debility and blood diseases.	Roots pickled & consumed locally as coolant for better health
Harvest methods	-----	Roots collected from soil pits in rocky areas

APPENDIX 2. Species profile of *Limonia acidissima*

<u>Particulars</u>	Scientific knowledge	Traditional knowledge
Location	Savanadurga (dry deciduous forest)	
Name	<i>Limonia acidissima</i>	Belada mara
Distribution	Dry to moist deciduous forests in India, Sri Lanka, Pakistan, Java and Malaysia	Occasionally along hilltops, foothills and plains
Phenology	Leaf fall during February-March; Leafing in March-April. Flowering in February-March; Fruiting in April and matures in December-February next year.	Flowers in February-April; Fruiting starts in April-May and matures next January-March.
Climate and Productivity	An alternate year high bearer.	Good rains during March-April are necessary for higher fruit yield
Animal interaction	Regeneration is aided by animal dispersal, which consume delicious fruits	Mammals consume fruits and disperse seeds, helping germination and regeneration
Regeneration/propagation	Propagation by seeds as well as stem, cutting	Scarce due to high trade in the past few years
Cultural relevance (Uses)	Edible fruits are considered tonic and antiscorbutic. Leaves are aromatic, carminative, astringent and yield an essential oil	Juice of fruit pulp relished as a coolant
Harvest methods	-----	Handpicking and collecting only the mature fruit

APPENDIX 3. Species profile of *Gymnema sylvestre*

<u>Particulars</u>	Scientific knowledge	Traditional knowledge
Location	Savanadurga (dry deciduous forest)	
Name	<i>Gymnema sylvestre</i>	Melemegala soppu, Madhunashini
Distribution	Distributed in central and Peninsular India; Paleotropic - global distribution	common everywhere in the study locality
Phenology	Leaf fall in January; Leafing during April-June; Flowering and Fruiting in September to December	Flowering in November-December; Fruiting in February-March
Climate and Productivity	-----	Good rains during June increase the leaf yield
Animal interaction	-----	-----
Regeneration/propagation	Seeds and vegetative propagation	Seeds and vegetative propagation
Cultural	Useful in curing inflammations,	Not used locally

relevance (Uses)	dyspepsia, constipation, jaundice, haemorrhoids, strangury, renal and vesical calculi, helminthiasis, cardiopathy, cough, asthma, bronchitis, intermittent fever, amenorrhoea, conjunctivitis and leucoderma	
Harvest methods	-----	Hand plucking only the mature leaves

APPENDIX 4. Species profile of *Cinnamomum malabathrum*, *C. sulphuratum*.

Particulars	Scientific knowledge	Traditional knowledge
Location	Agumbe (ever green forest, Western Ghats)	
Name	<i>Cinnamomum</i> sp.	Tamala patra, Lavanga patre
Distribution	Endemic to Western Ghats of southern India. In Karnataka, occurs in dense wet forests of Belgaum, Coorg, Hassan, Kolar, Uttar Kannada, Shimoga and Chikmagalur districts	Common along hill slopes & hilltops
Phenology	Flowering and fruiting in December to June	Leafing and flowering in January-February; Fruiting in March-April.
Climate and Productivity	-----	Trees in shade bloom in later season than trees in direct sunlight. Trees mature at 20 years; Take 3-4 years to restore leaf production after harvest
Animal interaction	-----	Seeds are animal dispersed
Regeneration/propagation	Seeds, cuttings and divisions of old rootstocks	Common unless traded, which lowers fruit production and lower leaf mulch on ground washes away the seeds in the heavy rains
Cultural relevance (Uses)	Bark used for cough, diarrhea and dysentery. Oil from the root bark and leaves is applied externally in rheumatic conditions, Spicy leaves and bark substituted for commercial <i>C. zeylanicum</i>	Leaves used as spice in cooking
Harvest methods	Poor regeneration is attributed to collection of all green leaves from all branches. It is advised to collect lower leaves to allow proper regeneration of tree.	Only mature leaves hand plucked during January-February. Leaf collection reduces flowering. Population is declining over the last ten years with few new recruits.

APPENDIX 5. Species profile of *Garcinia gummi-gutta*

Particulars	Scientific knowledge	Traditional knowledge
Location	Agumbe (ever green forest, Western Ghats)	
Name	<i>Garcinia gummi-gutta</i>	Murugalu Huli
Distribution	Endemic and common in evergreen forests of Western Ghats in Karnataka, Kerala and Tamil Nadu; Home gardens; Altitude: 50 – 1800m	Scattered along foothill & valley forests, common near habitations. Trees are protected from indiscriminate harvest in home gardens
Phenology	Flowering in December to February; Fruiting is from March to August	Flowering during January-February; Fruiting during March to May
Climate and Productivity	An alternate fruit bearer.	Good rains during March-April necessary for higher fruit yield. Traditionally people have been only picking fruits fallen on the ground, and using the dried rind as condiment in cooking curries, besides extracting and using seed oil as butter. Male trees don't yield fruits and also female trees that have sprouted new leaves, which happens every alternate year. Good fruit yield is 200-400 Kg per large tree of 20-40 years of age. Fruit production starts at the age of 10 years (~ 2 Kg / tree).
Animal interaction	Arboreal mammals such as squirrels consume the fruit and disperse seeds.	The ants, due to high oil content heavily predate seeds
Regeneration/propagation	Seeds, stem cuttings and grafts 45-60 days needed for regeneration, but regeneration does not equal survival rate necessarily due to recalcitrant seeds	Germination hampered by ants.
Cultural relevance (Uses)	Leaves, fruits and seed oil are reported to be purgative, hydragogue and emetic. Useful in curing ulcers, inflammation, bleeding piles, diarrhea, dysentery, indigestion. HCA is extracted from fruits and used for treating obesity. Often cultivated for its fruits.	Sour rind of fruits is used as condiment to flavour curries as substitute to tamarind, especially in coastal fish curries; Seed oil helps in better digestion and health; Domestic usage has decreased; Villagers prefer cash income than healthcare based savings and security.
Harvest methods	-----	Only fallen fruits on ground are hand picked; Fruit weight reduces to 12-14% after drying; Dried on a mesh using firewood.

APPENDIX 6. Species profile of *Vateria indica*

Particulars	Scientific knowledge	Traditional knowledge
Location	Agumbe (ever green forest, Western Ghats)	
Name	<i>Vateria indica</i>	Sal dhupa
Distribution	Endemic to Western Ghats of Karnataka, Kerala and Tamil Nadu along western slopes and lowlands and; also planted along highways	Common along roadsides in less forested plains
Phenology	Leaf fall in March; leafing in April–May; Flowering during January–April; Fruiting in May to July	Flowering in February–March; Fruiting in May–June.
Climate and Productivity	Occurs from sea level to 1,200 m in evergreen forests, especially along Water courses	Bumper crop every 3-4 years, Rains during March–April promote yield
Animal interaction	-----	Birds do not eat fruits, so dispersal is very local and along roadsides unless seeds are washed by rains into the forest
Regeneration/propagation	Seeds	Modest, getting naturalized in surrounding forests. Natural regeneration is good along the roadside forest strips.
Cultural relevance (Uses)	Resin is used for treating cough, asthma, leprosy, skin eruptions, crack infection, whitlow, wounds, ulcers, gonorrhoea, dysentery, anemia, chronic bronchitis, tubercular glands, diarrhoea and ringworm; Fatty oil is antibacterial and is used in controlling rheumatism. Fruits used for bronchitis, rheumatism, and locally as a painkiller. Seed oil for soap and candles	Not used locally.
Harvest methods	-----	Only fallen, matured fruits or seeds are collected & traded.

**INSECTS AND INSECT PRODUCTS IN SOUTH INDIAN
TRADITIONAL MEDICINE**

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India- 2.4% area occupies in world but accounts for 7.3% of total fauna.

Tribals- livelihood depend on plants and animals – depot of knowledge – verge of extinction - scientific community – document, use for benefit of mankind.

Medicinal uses of animals-

Zootherapy- Ethnozoology.

WHO

- 252 chemicals essentials

for humans

- 11.1% from plants

- 8.70% from animals.

Ethnobotany – more attention

Ethnozoology – less attention.

Insects – less explored,

recent scientific recognition –

entomoethno medicine,

-ethnoentomology

or use of insects in traditional medicine.

Kerala – 37 tribes;

Karnataka – >30;

Tamil Nadu – 39 tribes

Termites:

Arcot district, Tamil Nadu- winged, sexual, adult forms called Eesal in Tamil.

Irumbars tribe – collect termites – After Ist shower – 3-4 lamps around each termitorium- termites get attracted by lamps- fly around them, lose wings, fall down, crawl and die on floor. In

the morning, Irumbars sweep the floor, collect termites

- town and sold. Merchants fry a portion of termites
- and keep them for sale. To balance
- the quantity of Easals, fried groundnuts,
- bengalgram, puffed rice, salt and spices
- are added and mixed well. Delicious
- and nutritious (proteins).
- Cost: Rs.200/Kg in 1979. Africa-Tribals
- wait in front - terminalia with large, green leaves

to collect termites (Synder, 1935).



Karnataka – Lambanis – tribe in Heggadevanakote, Mysore hanga pole with lamps/lighted lanterns in front of their huts. Also tribes in Hassan, Tumkur, Chitradurga Queen of termites fed raw to

Weak children. (Rajan, BKC, 1987).

Kerala – Kurichchan tribe termites – rheumatic diseases, body pain Anaemia. Ulcer – decoction of termites + *Vitex negundo* leaves winged termites – *Odontotermes formosanus* is dried, powdered with milk administered winged termites are fried in coconut oil, powdered and stored in container.

Irular tribe – termites and termitorium \diamond anaemia, separately powdered, dried and fed to pregnant women. South Indian tribes roast, winged termites in earthen pots and consume in the evenings for 3 days – asthma- antimicrobial properties.

Recently, two antimicrobial peptides- termicin and sinigerin – isolated from fungus growing termites, *Pseudocanthotermes*.

P. Spiniger – termicin – a cystein – rich antifungal peptide-antimicrobial properties.

Odontotermes feae – Manipur – important source of proteins for tribes.

Termites – important human diet – Africa, Latin America, Asia, Australia – Ape man, chimpanzees, anteaters, wolves feed on Termites.

O. formasanus – effect of feeding on growth and reproduction of swiss mice – *Mus musculus*

Honey bee (*Apis indica*) :

Honey for headache, mouth ulcer, burns, cough, asthma, chest infection, throat pain, body pain, fungus infection, general health. Irular/Mudugar/kurichchan tribes use honey for cold, insect bite and conjunctivitis.

Honeybee eggs + larvae – Irular + Mudugar – backpain, chest pain, chest infection and better vision.

Headache – honey is applied on the forehead.

Mouth ulcer – Diluted honey (pure water) topically applied on the affected area.

Asthama – cumin seeds are fried powdered, mixed with honey and administered orally.



Chest pain – honey mixed lime water.

Throat pain – equal quantity of honey and sap of *sida* species.

Cold – leaves of *Ocimum sanctum* (thulari) and onion (*Allium cepa*) is crushed and sap mixed with honey.

Conjunctivitis – honey mixed with *Phyllanthus niruri*.

Bee bite – paste of bee sting + *Datura fastuosa* leaves on affected area.

Propolis – resin wax substance – arthritis meals, ulcers.

Little bee – *A. florea*- Tuduvaes – special medicinal value – asthma, lung infection

Ant

Panixan tribe – mud from interior of anthill – scabies mud – tropical – affected area.

Black beetle Irular tribe – mix leaves of leucas aspera (Thumbe) + thulasi +

Black colored small beetles – boil in a pot –

decoction – applied topically/ oral 3 times/ day before meals – malaria.



Wasp (Eumenes sp.) Kurichchan tribe – nest of wasp – paste applied on forehead – headache.

Wasp nest is boiled in coconut oil and applied on forehead.

Wasp bite/poison – roasts of eggs, paste with water and topically applied on affected area.

Mole cricket (*Gryllotalpa gryllotalpa*) Scarab larvae/cicada nymphs/centipedes

Sprain – kurichchan tribe – paste of *Gryllotalpa gryllotalpa* topically applied.

Insect – cheapest source of animal proteins

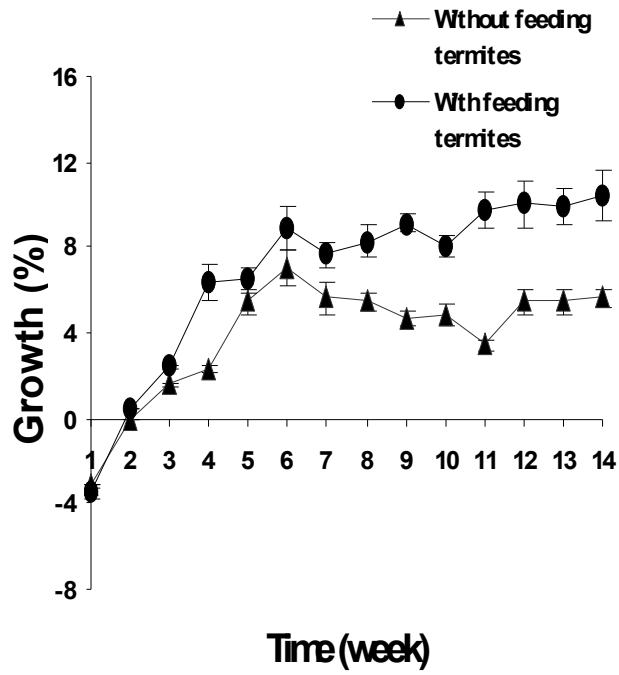
soil dwelling ants – explore for antibacterial and antifungal compounds.

South Korea – 17 medicinal insects.

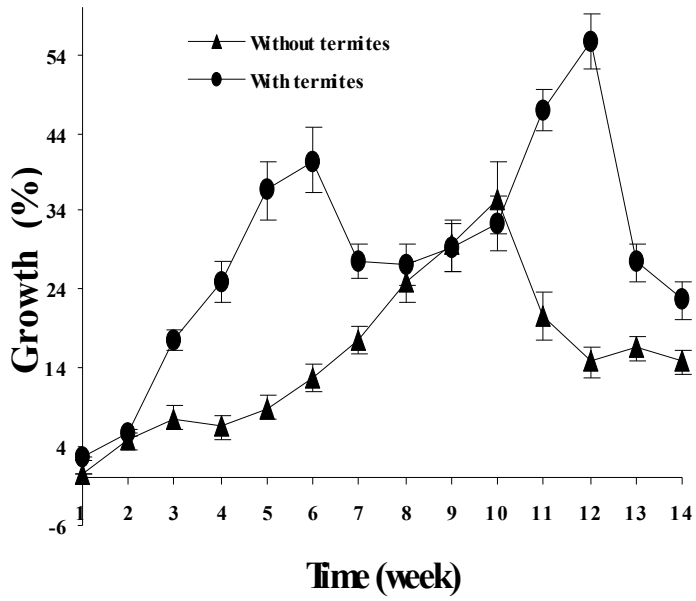
China – 140 medicinal insects.

India -->100 medicinal insects.

Awareness/ education on domestication, conservation/preservation of medicinal insects in a sustainable way.



on.



Paramparika Vydya Paddati Nadedubanda Dari

Pandit Paramshivaiah,

Secretary, Paramparika Vydya Parishat,

Tiptur

ಸಾವಿರಾರು ವರ್ಷಗಳಿಂದ ಋಷಿಮುನಿಗಳು ಜನ - ಜಾನುವಾರುಗಳಿಗಲ್ಲಾ ಪರಿಸರದಲ್ಲಿಯೇ ಸಿಕ್ಕುವ ಹಸಿರು ಮೂಲಿಕೆಗಳಿಂದಲೇ ಔಷಧೋಪಚಾರಗಳನ್ನು ಮಾಡುವ ವಿಧಾನವನ್ನು ಅವರ ಜೀವಿತ ಅವಧಿಯಲ್ಲಿ ತ್ಯಾಗ ಮಾಡಿ ಗುರುತು ಹಚ್ಚಿ ಜಗತ್ತಿನಾದ್ಯಂತ ಜನರ ಆರೋಗ್ಯ ಸುಧಾರಿಸುವಲ್ಲಿ ಮೂಲಿಕೆಗಳನ್ನು ಬಹಳವಾಗಿ ಗುರುತು ಹಚ್ಚಿ ಸುಲಭವಾಗಿ ಬಳಸಲು ಅನುಕೂಲವಾಗುವಂತೆ ಗ್ರಂಥಗಳನ್ನು ರಚಿಸಿ ವಿದ್ಯಾವಂತರ ಕೈಸೇರುವಂತೆ ತಮ್ಮದೇ ಆದ ಭಾಷೆಯಲ್ಲಿ ಅಂದರೆ ಸಂಸ್ಕೃತ, ಕನ್ನಡ, ತೆಲುಗು, ತಮಿಳು, ಉರ್ದು, ಮರಾಠಿ ಹಾಗೆಯೇ ಅನೇಕ ಭಾಷೆಗಳಲ್ಲಿ ಗ್ರಂಥಗಳನ್ನು ರಚಿಸಿ ಜನಸಾಮಾನ್ಯರ ಕೈಗೆ ಸೇರುವಂತೆ ಸೇವೆ ಸಲ್ಲಿಸಿರುತ್ತಾರೆ. ಈ ಪುರಾತನ ವಿದ್ಯೆಯನ್ನು ಮನಗಂಡು ನಮ್ಮೆಲ್ಲ ಹಿರಿಯ ಜ್ಞಾನಿಗಳು ಉಚಿತವಾಗಿ ಸೇವೆ ಸಲ್ಲಿಸುತ್ತಾ ಬರುವಾಗ ಅವರ ಜೀವನ ನಿರ್ವಹಣೆಯು ಅಂದರೆ ಸಾಂಸಾರಿಕ ಜೀವನದಲ್ಲಿ ಅನ್ನದ ಕೊರತೆಯುಂಟಾಗಿ ಅವರು ತಮ್ಮ ಮುಂದಿನ ಪೀಳಿಗೆಗೆ ಈ ಕೊರತೆಬಾರದಿರಲೆಂದು ಅರಿತು ಅವರೇ ಅನುಭವಿಸಿ ರಚಿಸಿದಂತಹ ಗ್ರಂಥಗಳನ್ನು ಮತ್ತು ಮೂಲ ಗ್ರಂಥಗಳನ್ನು ಸುಟ್ಟು ಹಾಕಿದ ಉದಾಹರಣೆಗಳು ಸಾಕಷ್ಟಿವೆ.

ಆದ ಕಾರಣ ಘನ ಸರ್ಕಾರ ಈ ಅಳಿಸಿ ಹೋಗುತ್ತಿರುವ ಅಂದರೆ ವಿನಾಶದ ಅಂಚಿನಲ್ಲಿರುವ ಪಾರಂಪರಿಕ ವೈದ್ಯರನ್ನು ಗುರುತಿಸಿ ಈ ವೈದ್ಯ ಪದ್ಧತಿ ಬೆಳೆಯಲು ಸಹಕಾರಿಯಾಗಬೇಕೆಂದು ನಮ್ಮೆಲ್ಲರ ಅಭಿಮತವಾಗಿರುತ್ತದೆ. ಈ ವಿಚಾರವಾಗಿ ಕೆಲವು ಯೋಗ್ಯ ಗುರು ಪರಂಪರೆಯಿಂದ ಬಂದಂತಹ ನಾಡಿ ನೋಡಿಯೇ ಕಾಯಿಲೆಯನ್ನು ಗುರುತಿಸುವ ಯೋಗ್ಯ ಮೂಲಿಕೆಗಳನ್ನು ಗುರುತು ಹಚ್ಚುವ ಪದ್ಧತಿಯನ್ನು ನೆನಪು ಮಾಡಿಕೊಂಡು ಆತರಹದ ತರಬೇಯಿಂದ ಕೆಲವು ರೋಗಗಳನ್ನು ಗುಣಪಡಿಸಲು ಮುಂದಾಗಿದ್ದರು. ಉದಾಹರಣೆಗಳಾದ ಸೂಲಗಿತ್ತಿಯರು, ಮಕ್ಕಳ ಕಾಯಿಲೆಯ ತಜ್ಞರು, ವಿಷ ಸರ್ಪದ ವಿಷ ನಿವಾರಣೆ, ಸಚಿತಾನೋತ್ಪತ್ತಿ, ಎಲ್ಲ ತರಹದ ಜ್ವರಗಳಿಗೂ ಔಷಧಿ, ಪಾರ್ಶ್ವವಾಯು, ಆಮವಾತದಂತಹ ಕೆಟ್ಟ ವಾಯುವಿಗೂ ಅಲ್ಲದೆ ದೊಡ್ಡರೋಗ (ಹೆಚ್.ಐ.ವಿ), ಮಧುಮೇಹ, ರಕ್ತದೊತ್ತಡ, ಅರ್ಬುದ (ಕ್ಯಾನ್ಸರ್), ಶ್ವಾಸಕೋಶದ ರೋಗಗಳಾದ ಹಸ್ತಮಾ, ಟಿ.ವಿ. ಕಾಯಿಲೆಯನ್ನು ಸಹ ಗುಣಪಡಿಸುವ ಔಷಧಿಗಳಲ್ಲದೆ ಹೃದಯ ಸಂಬಂಧ ಕಾಯಿಲೆಗಳಿಗೂ, ನರ ದೌರ್ಬಲ್ಯದ ತೊಂದರೆಗಳಿಗೂ ಅಂದರೆ ಅಸಾಧ್ಯವಾದ ಕಾಯಿಲೆಗಳಿಗೂ ಅಲ್ಲದೆ ಚಮತ್ಕಾರ ವಿದ್ಯೆಗಳಾದ ಭೂತ ವೈದ್ಯದಲ್ಲಿಯೂ ನಿಪುಣರಾಗಿದ್ದ ಪಾಂಡಿತ್ಯವನ್ನು ಹೊಂದಿದ ವೈದ್ಯರನ್ನು ಗುರುತಿಸುವ ದಿಸೆಯಲ್ಲಿ ನಾವೆಲ್ಲ ಮುಂದಾಗಬೇಕಾಗಿದೆ.

ANCIENT TRADITIONAL PRACTICE IN KODAGU WITH REFERENCE TO AATI SOPPU

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INTRODUCTION

The name of the district “Coorg” is derived from ‘Kodimalenad’ meaning dense forest land on steep hills. The district is renamed as Kodagu after reorganization of Karnataka State on 1st November, 1956. The district shows high variation in temperature, rainfall and other meteorological factors since a major part of the district lies in the Western Ghats and the rest in the plateau region to the east. High humidity, heavy rainfall and an equitable pleasant climate are the characteristics of Kodagu.

The average annual rainfall in the district is 2840.3mm falling on an average of 144 rainy days. The average annual rainfall at Bhagamandala in the west is 6037.1 mm. Heaviest rainfall months are June, July and August, July being the heaviest (1936.8mm). Forests in Coorg are called a ‘Male Kadu’ or hill forests and ‘Kanive Kadu’ or hillock jungle.

In India about 8000 plants are recognized with medicinal values that are being used by various traditional systems of medicinals such as Ayurveda, Homeo, Sidhha, Folk, Tibetan, Modern and Unani. Tippli, a wild plant now has been recognized as the medicinal plant and being cultivated commercially in Assam, Orissa, Karnataka, Maharashtra, Keral and Annamalai hills of Tamil Nadu (Agrobios, Vol. II No. 7 Dec. 2003 pp. 49-50).

Kamegh is wildly used in Ayurveda and Unani, Sidhha, Homeopathy known as antipyretic, anti-periodic, anti-inflammatory, anti-helminthic, digestive and stomachic. It is useful in ulcer, chronic fever, Malaria, Cough, Bronchitis, Dysentery and in Pitta (Agrobios-Vol.I, No.7. Dec. 2002 pp 30). Herbs have always been the principal form of medicine in India. People in Europe, North America and Australia using herbal plants as medicines. Medicinal plants also play an important role in the lives of rural people, particularly in remote parts.



Justicia wynaadensis

(Aati Soppu)

Rungia pectinata: Taxonomy of this plant gives mixed views. In the book Flora of Coorg (Kodagu) Karnataka, with data on medicinal plants and chemical constituents placed it as *Rungia pectinata* species and as *Justicia Wynaadensis* both belong to Acanthaceae family.

This is also named as follows:

1. *Rungia pectinata*
2. *Justicia Pectinata*
3. *Rungia parviflora*
4. *Justicia wynaadensis*
5. *Gendarussa*
6. *Adhatoda wynaadensis*

It is one variety of medicinal plant, which grows as a bushy shrub in the humid tropical belts particularly in Kodagu district.

The plant is more prevalent in the areas where there is no observance of direct sun light. A typical juice is produced in all the parts of the plant that is in the leaves, stems and twigs. There is historical saying by the elders that, the juice or extract is produced inside the plant only in the month of Aati Masa or Ashada Masa. (During July, August period in Gregorian calendar). During Pushaya rainy season (Aati Masa) it is believed that, this plant produces 18 types of Ayurvedic properties (Mulikas).

Each Mulika is added one by one inside the plant juice right from the 1st to the 18th day of this Aati masa. The people of the whole Kodagu district consume the juice extract. This has been practiced from the ancestral time. The place where the plant grows is surrounded by particular fragrance.

It is said that, if the juice extracts is consumed at this time, it generates heat and stabilizes the body temperature. Since the Pushaya rains are horrible, cold windy and rains heavily, it brings shivers in the body. Since the leaves of the plant have been used as extract in this Aati Masa it is called "Aati Soppu" in Arekannada and "Maddu Toppu" in the Kodagu language.

Due to the heavy rain most of the people fall ill and suffer from cold, fever and headache. This extract has the medicinal value, which gives resistance to the people in this masa from fever and cold. People consume the extract of the plant in various forms like "Payasa or Soup (Ganji)". It is prepared by adding the pepper, garlic, cardamom and jaggery. Sugar is not used in this preparation. It is garnished with honey and coconut scrapings and consumed. It is advised to eat with half empty stomach.

Over night preparation is given to the children at 5 o'clock in the morning, so that it acts as de-worming agent and destroys the worm in the stomach. It is said that, by drinking aati ganji or aati soup urinary track is cleaned. Urine passed at about half an hour after consumption of the juice / preparation looks blood red in color. It is also said that this aati soppu has a great medicinal value in purifying blood. Person who is suffering from urinary track infection is advised to consume one glass of the juice of the plant, which helps, in subsiding the infections. So it is said by the people of the Kodagu district that it is a herbal or ayurvedic tonic, which purifies the blood.

People suffering from gastric problem are suggested to consume the preparation at lesser quantity or only for a single day. All types of people, old, children and even just delivered mothers use it because of its good prospects. It is not restricted to anyone. It is widely believed that after this 18th day, the extract produced by the plant gets reduced, regularly with every day passing and finally disappears. After this aati masa extract of the plant will turn from dark purplish pink color to pale red color. The fragrance disappears and defoliation takes places. Finally it is believed to be a great boon to the Kodagu people, which has so many medicinal properties. Therefore, there is a need to obtain more information from different sections of the society and need to document as per the requirement of Biodiversity act.

Cultivation and Conservation of Rice Genetic Diversity: Functional Implications of Local knowledge in the Central Western Ghats:

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Key words: Rice agro-biodiversity, Local knowledge, Western Ghats

Abstract:

Rice is the major cereal grown in the Western Ghats and being a center of diversity for rice, it harbors considerable number of traditional rice varieties grown by farmers since centuries. However, with the emerging problems such as increasing costs of cultivation and labor shortage, there has been marked shift from paddy cultivation to either non cultivation or to conversion of paddy lands into commercial crops such as banana, coffee and areca nut. This trend is threatening the invaluable agro-biodiversity of paddy varieties along with erosion of associated indigenous knowledge systems. Without the concrete efforts of conserving varieties and documenting indigenous knowledge, we might irreversibly loose this important resource and knowledge. Realizing this, we have initiated efforts towards this end and salient findings of our efforts in selected two taluks of the central Western Ghats is presented here. We found that traditional varieties along with the associated indigenous knowledge still have significant role to play in rejuvenating paddy cultivation in these taluks of the Western Ghats. Further, the functional implications of the knowledge can be extended even to other paddy growing parts of the state.