Gender Dimensions of Wild Food Management in Wayanad, Kerala

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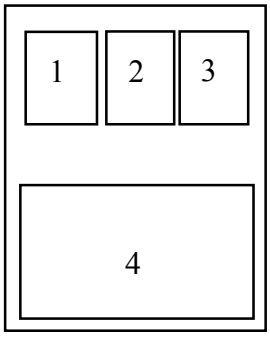
Much of the information, knowledge and knowledge leads contained in this book have been sourced from the tribal communities of Wayanad, particularly the Paniya, Kattunaikka, and Kuruma communities. While individual knowledge holders have been acknowledged in this book, the authors wish to assert that the study captures essentially some of the traditional collective wisdom and knowledge of the tribal communities. The attendant rights over this body of knowledge is hence truly their preserve. The authors however accept the responsibility for errors or inaccuracies if any.

Front Cover :



1 & 3 . paniya women identifying mushroom
2. paniya family collecting dioscorea tuber
4. wild green collection scene

Foreword

The Indian sub-continent is unique in the richness of its biodiversity wealth and related traditional knowledge. There are over 550 native or tribal communities under 227 ethnic groups hold the knowledge to use these resources for their livelihood security in the country. But the TK system in India is fast eroding. There is an urgent need to inventorise and record all ethnobiological information among the diverse ethnic communities before the traditional cultures are completely lost. The aspect of quantitative evaluation of the use and management of the natural plant and animal wealth, the experimental assessment of the benefits derived from this wealth and utilizing the traditional ecological knowledge for biodiversity conservation and community development have brought recognition to ethnobiology as an important and crucial area of research. The objective of socioeconomic upliftment of the tribal and traditional communities in the light of the recent legislations in India on biodiversity conservation and Farmers Rights has gained significance.

Often ethnobiological studies lack evidence about how women and men differ in their relation to biological diversity. This research study, focused on the tribal communities, that are dependent on wild foods and other forest resources for their subsistence, describes these differences. It also illustrates the trends in the use and management of 'wild' edible species within and between households pertaining to three ethnic and one migrant community in Wayanad district, an Agrobiodiversity hot spot in southern Western Ghats. The study sought to focus its attention on the wild food management practices of prominent tribal communities of Wayanad, namely the Paniya, the Kuruma and the Kattunaikka.

I am grateful to Dr. N. Anil Kumar and Mr. M.K. Ratheesh Narayanan, who along with Ms. M.P. Swapna have carried out this study among the tribal and non-tribal communities, signaling the beginning of a long-term documentation and tribal developmental programme using their own wealth of TK sponsored by the Utara Devi Resource Centre on Gender and Development and Community Agro-biodiversity Centre in Wayanad, with financial support from the Ford Endowment. The objective is to chronicle the role of 'wild foods' in the strengthening of local level food security systems. The gender dimension is integrated into this programme, since women are often the conservers of life-saving crops and holders of traditional knowledge.

The study should help in understanding the coping mechanisms developed by tribal and rural families to meet the contingencies of drought and other natural calamities. Through an understanding of such risk-minimising and calamity-coping strategies, a more realistic, low-cost and local agro-ecosystems-compatible food security system can be promoted.

M.S. Swaminathan

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About the study

In the decade since the early 1990s, the livelihood options of the poorest have been steadily shrinking. Process of economic globalisation, international agreements on trade and biodiversity, and national environmental and forest policies have impinged in complex ways on the use and sustainability of the natural resource base. This, together with the displacement and relocation of settlements, and local resource-use conflicts, poses difficult challenges to people's livelihood strategies. The poorest, such as some of the forest-dependant adivasi groups of Waynad district in Kerala, are especially vulnerable. They are on the edge of starvation (surviving on free food rations from the government), and in a chronic state of health risk, which undermines their ability to live and work with dignity.

Set on the edge of the Western Ghats and the Deccan Plateau, Wayanad is a region of great ecological and human diversity. It has a varied topography, climate and vegetation, and hence a range of landscapes. Once known as the land of hill forest and paddy fields (Vayalnadu), Wayanad is now a land of plantations: coffee, rubber and coconut besides cardomom, ginger, pepper and tea. Its formerly lush paddy fields are swiftly being transformed into banana groves, altering the ecology of the region

One sixth of the total populations are adivasi; nine groups are currently listed as Scheduled Tribes: these include the Kattunaikkan, originally gatherer-hunters; the Adiya and Paniya, agricultural laboures; the Kuruma and the Kurichya, both settled cultivators. Each of these groups has different resource needs, interacting differently with the natural environment. The district has also been peopled by successive waves of settlers, including muslims,Christians, Hindus and a small population of Wayanad Chetties, with their own patterns of resource usage.

Because of the prevailing gender ideology of many of these socio-cultural groups, women bear the major responsibility for food provisioning. Adivasi women (poor agricultural labourers and forest-dependent groups in particular) have developed a vast repository of knowledge of lesser-known foods that are foraged from the wild: leafy greens, fruits, seeds, and tubers, mushrooms, honey, crabs, fish etc. These 'wild food' sources are found in forests, wetlands, fields and plantations, along wayside paths, and besides streams. Many have multiple uses and some are medicines. For the poorest these foods have provided a reliable buffer in lean seasons and enhanced the nutrient quality of their food. In recent times, however, because of the erosion of habitates, invasion by alien species, and the widespread use of agricultural chemicals, the wild foods are no longer as easily available. With changing food habits an increasing preference among the younger generation for food bought from the market, the older women's knowledge of these foods is being marginalised.

This complex process of change is at the core of the study on wild food management in southern Wayanad, which has documented the ethnobiological (primarily ethnobotanical) knowledge of the Paniya, Kattunaikka and Kuruma. Following a participatory approach, Ratheesh Narayanan and Swapna have attempted to use the adivasi's own frameworks, terms and categorizations. Their study has also tried to blend the disciplinary perspectives, method and tools of social anthropology, gender studies and ethnobiology. This innovative methodology has resulted in a participatory,

gendered ethnobotany that provides a richly detailed picture of the dynamics of wild food management on the ground.

The three Adivasi group studied have different food production systems, and the gender roles also vary. Both the Paniya and the Kattunaikka are foragers and fishers; foraging is mainly women's work among the Paniya but it is more-or-less equally shared by Kattunaikka men and women. Among Kuruma groups, engaged in traditional agriculture, both men and women are involved in wild food collection while homestead farming is mainly women's responsibility. Some Kuruma and non-adivasis are now also marketing wild foods to more distant markets, which could threaten the sustainability of these resources. The Paniya, who are most dependent on foods from wild and semi-wild areas, know about an amazing number of edible species. Paniya women are skilled in managing disturbed habitats such as the margins of paddy fields, water channels and roadsides.

The broad trend, however, is a marked decline in the adivasi's dependence on wild foods. Women's key role in food production is also undergoing complex changes. While most women continue to be responsible for feeding their families, the resource base available to them is diminishing rapidly. This puts them under great pressure to cope and affects their position in the household and social group.

Poor adivasis have a sophisticated understanding of their situation and of the potential and limitations of wild food resources. They are aware that wildfoods by themselves cannot be a substitute for sustainable livelihood strategies. Yet, they are also aware that especially in the difficult food-deficient monsoon season, the wild leafy greens are a key dietary supplement. We now need to build upon their existing management practices to enable more efficient growth of some of these and other food species in homestead gardens.

The adivasi groups are also aware that documenting the disappearing wild food species and declining management practices is necessary to keep alive this knowledge. Yet they are also keenly aware of the risks of such documentation, and the possibility that outsiders could exploit this for commercial gains. It is the moral responsibility of all those who use this study to be alert to possible unethical uses of the knowledge that belongs not to the authors and sponsors of this work, or even to the individual adivasisi who are listed as the 'key knowledge holders' but to the adivasi community as a whole. We urgently need to seek ways to enable the adivasi to assert their rights over this knowledge, as also over the resources and the lands that support these resources. The sustainable and equitable management of natural resources cannot be separated from the context of people's resource base, their traditional knowledge systems and the contemporary changes in their life-worlds.

Sumi Krishna

Adviser to the study

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Executive Summary

The striking biodiversity that survives despite the calamitous human interventions still lends an unparalled uniqueness to the Indian sub-continent. There are over 550 native or tribal communities that come within 227 ethnic groups who depend on this biodiversity and constitute a phenomenal human biodiversity in itself. These communities are inheritors of the wisdom that has trickled down through generations endowing them with an inherent sensitivity towards nature. The tribal communities are thus integral constituents of the delicate ecological network even while utilizing its precious resources for their livelihood. The tragedy though is that even what remains of the *traditional knowledge systems* in India, is fast disappearing. One of the many approaches of retrieval is to document and record ethnobiological information that exists among the diverse ethnic communities; not just with the intention to save the knowledge systems but along with it ensure the survival of the traditional cultures and communities as well.

The objective of socio-economic upliftment of the tribal and traditional communities in the light of the legislations on 'domestic patent act' and 'intellectual property rights' have gained enough significance in recent years. As a result there is an ever-increasing necessity in quantitative evaluation and assessment of the use and management of natural plant and animal wealth. Ethnobiology has therefore attained momentum as a distinctive area of scientific research that is not merely to experimentally assess and derive benefits from the existing natural wealth but with a basic responsibility towards conservation of natural resources, while protecting the rights of the communities that directly depend on it.

Often, ethnobiological studies fall short of taking a look at a gender based difference in perception to the biological diversity that nurtures habitation. This research study therefore focuses on how women and men of the tribal communities relate to their forests while drawing on wild foods and other forest resources for their subsistence. The study also specifically factors in the trends in the use and management of 'wild edible species' with reference to three ethnic and one migrant community in Wayanad District. Wayanad, a hilly region in the southern Western Ghats, with its myriad agro biodiversity can be one of the most inspiring locations to carry out a study of this nature. The study sought to focus its attention on the wild food management practices of three prominent tribal communities, namely the Paniya, the Kuruma and the Kattunaikka. Simultaneously a comparative study was also done on the non-tribal settler communities to observe the differences in their approach to wild food resources - its utilization as well its conservation.

The study focused primarily on seven major groups of wild foods that include edible green leaves, tubers, mushrooms, fish, crabs, honey, edible fruits and seeds. A total of 362 people were interviewed and 20 key knowledge holders were selected from each community. Through survey and PRA methods different aspects relating to edible 'wild' species has been

documented. Factors pertaining to availability of wild food, methods used in collecting them, preferences of one variety over another, multiple uses of the wild produce as well as the efforts put in marketing the forest produce have been taken into consideration while documenting the research.

The report in its entirety consists of six chapters and five appendices. Beginning with a brief background, the introductory chapter outlines the broad based objectives of the study. The second chapter gives an overview of the methodology employed and the research questions addressed. The third chapter is assigned to bring out a detailed profile of the prescribed study area as well as the profile of the communities under concern.

The fourth chapter puts forth the results arrived at based on the studies conducted at various sites. The chapter captures and details out 362 species of wild edibles. It traces the places where these wild edibles proliferate, the communities that come in search of the edible forest yield during different seasons as well as the colloquial terms that are commonly used to describe them. The chapter then proceeds to give an appraisal of the gender roles that come into play during harvesting and processing of the wild foods. It was interesting to note that leafy greens are the most widely consumed among the various wild food. The study identified 102 varieties of wild leafy greens, which have great dietary importance and are a regular food supplement among the socio-cultural groups under study. It was also found that women play a key role in collecting as well as processing of edible leaves. Many edible greens are popular within the tribal as well as non-tribal people for their therapeutic properties. Certain greens also have significant ceremonial value and are used in various community rituals. Women of the communities are more in the know-how of edible greens. More than 25 wild plant species are known for their edible roots, tubers and rhizomes. Of these, 19 belong to the species *Dioscorea*. Wild *Dioscorea* species still form a major source of food for forest-dependent communities like the Kattunaikka. There is a clear gender difference that can be clearly observed in all the afore-mentioned socio-cultural groups when it comes to gathering the wild Dioscorea species. While men and children go after fruits and edible seeds as a matter of individual choice, the women on the other hand gather plenty of leafy portions that must suffice for the family as whole. Fruits and seeds form an important group of edibles and there are 62 such species that contribute towards the food basket of the tribal communities. The study also reveals that there are 39 varieties of fish, 35 varieties of wild mushrooms, 5 species of crab and five types of honey that are commonly consumed by the people coming within the study area. While it is mostly the womenfolk who are adept in locating, collecting, processing and preserving mushrooms and crabs, collecting honey is a task where men are skilled.

The fifth chapter provides a view of the role wild foods play at times of crisis, especially famines. It records the varieties that offer sustenance to the tribal population during hard times. The Paniya community depends heavily on the wild environment for their needs. Around

202 edible wild species are known to the Paniya community. Most of these are collected from semi-wild surroundings. The Kattunaikka, who live predominantly in the forests come next to the Paniya community as far as their knowledge and dependence on wild food is concerned. The number of edible species known to them comes to about 117. Last comes the Kuruma community. Interestingly this community is involved in agriculture as well, and that could be one reason behind their familiarity with just about 88 wild species.

Among the non-tribal and settler communities, the Muslim community seemed visibly lacking in resources. And the absence of resources makes it necessary for the women of this community to collect edible food from the semi-wild environment and they particularly go in search of the greens. The situation differs with the Christian community. They belong to the middle peasantry and but for the occasional game meat by a miniscule minority among them, their dependence on wild food seem to be limited.

The decline in traditional knowledge related to wild food in the present generation is a stark reality that could not be missed while conducting the study. The changes in gender relations and its impact on food species management, the perception of both males and females (of different age groups) about the structure, function, and dynamics of the agricultural landscapes vis-à-vis availability of food species also came under the purview of this study. The implications of land use changes, agrochemicals, restrictions of forest access, development impacts and impact of alien species invasion on the availability of wild food are also highlighted in this chapter.

The final chapter elaborates on the key learnings and recommendations of the study. Some conclusions are reached: First, many tribal and rural families of this district still conserve a wide range of plants for their food needs. Women are more skillful in managing the surrounding landscape and are the main knowledge holders and conservationists. Second, women are taking effective steps to sustainably manage landscapes and species that provide edible greens, but changing trends in gender relations inhibit their efforts. Finally, the decline in the traditional knowledge systems, especially among the youth is affecting the sustainable use of many 'wild' edible varieties - high frequency signals that cannot but be picked up.

Chapter 1

Introduction

The pre-eminent position of plants among natural resources that satisfy the primary needs of human beings cannot be over-emphasised. Despite the giant strides in the field of science and technology, this dependence on plants even as a direct source of food, medicine and a host of survival exigencies of humans has only marginally reduced. The trajectory of human progress through the ages has witnessed, on the one hand, the over-exploitation of some plant species and on the other, the aided preservation, proliferation and improvement of certain others. The human effort in the preservation of plant life and the drawing, in turn, of sustenance from them gives rise to an intimate plant-human relationship. Knowledge of this intimate relationship is the subject matter of ethnobotanic enquiry. It is a fact of life that urbanisation has resulted in the estrangement of a sizeable section of the human population from their plant benefactors. But rural agrarian communities and the tribal populations continue to lead a life of relatively greater interdependence with their natural environment and depend directly on plants and other natural resources for their various needs.

The present study has focused on the tribal communities that are dependent on wild foods and other forest resources for their subsistence. Developmental interventions and the impact of various national and state forest policies have adversely affected the availability and access of the tribal communities to these forest resources and effected significant changes in their lifestyles. Parallel to the alarming depletion and at times total disappearance of a variety of flora on which the tribals depended for their sustenance, has been the erosion of tribal knowledge on the uses of a variety of plant species. There is now, thankfully, a growing awareness of the value of such traditional knowledge and a recognition of the urgent need to document such knowledge concomitant to the efforts to preserve the natural forest environment and what remains of its flora and fauna diversity.

Biodiversity

The diversity present within and between species in the thousands of plant, animal and microbes of ecosystems constitutes an inter-generational resource of vast social, economic and environmental importance. The life forms are characterised by inherently high levels of variation and extensive natural ranges and the correspondingly high level of genetic variation ensures present-day and future adaptability to change and their continued evolution. However, the integrity of wild genetic resources is threatened by a number of human activities (McNeely *et al.*, 1990). These include deforestation and changes in land use, inappropriate forest harvesting techniques, pollution and climate change and the often uncontrolled and undocumented movement of forest germplasm for plantation establishment, leading to the loss of locally adapted populations (GBS, 1992). To make better use of existing potential and to minimise negative impacts of genetic loss, there is a need to raise awareness of the need for sound management of plant genetic resources. As the natural distribution of many species and landscapes crosses political borders, this highlights the need for not only national but also international collaboration.

Edible plant diversity associated with paddy field ecosystem

There are at least 3000 edible plant species known to mankind, but just about 30 crops alone contribute to more than 90% of the world's calorie intake and only 120 crops are economically important at the national scale (FAO, 1993). This shows that several hundreds of species remain discarded or unnoticed at the hands of various human societies. Among the edible plant diversity, many are nutritionally or otherwise important. For example, quinua (*Chenopodium quinua*), a staple grain of Incas is little known to the modern world, yet it is one of world's most productive sources of protein (Reid & Miller, 1989). Similarly a number of such little known crops and edible species found in the wild are not getting recognition, though they play a crucial role in the food security of tribal and rural families. For instance, various wild species of dioscorea, taros, and amaranthus, which are the source of vitamins and nutrients, supplement the food needs of a multitude of families who live near to forests (Roy *et al.*, 1998). Such species have the potential to be commercially introduced to solve the problem of food insecurity in many parts of the world. Leafy greens, tubers, mushrooms and wild animals add diversity, flavor, vitamins and minerals to characteristically grain-dominated diets. The most important and well-documented use of wild foods is in meeting seasonal shortfalls especially during periods of acute scarcity (hunger months) at the onset of the rains. During hunger periods the practice of digging up roots and tubers and gathering fruit and nuts are almost universal. A wide variety of cultivated plants used by mankind today have been derived from such wild related crop plants (Swaminathan & Jana, 1992).

A number of publications have discussed the role of wild food, particularly during stress seasons in the household food security and the nutritional

security of poor tribal and rural families (Singh & Singh, 1981). Animal food from forest and wild trees contributes a significant portion to the wild food consumed by the forest dependant communities (Falconer & Arnold, 1991). Arora & Pandey, (1996) reported 1532 wild food species as edible from India, mostly from the Western Ghats and Himalayan regions. Most of the publications related to wild food provide largely information on forest foods (FAO, 1982, 1984, 1989; Falconer, 1990). However, there are various other landscapes outside forest areas, for example, paddy fields, wayside bushes, canal banks and the agricultural fields, which yield diverse kind of edibles like leafy greens, crabs, fish and other such small animals. Wild food also contributes to the household income security of millions of forest dependent communities. In India those who collect species such as gooseberry, garcenia, parmelia and honey for market are mostly dependent on it as their major source of income (Muralidharan *et al.,* 1997).

Mushroom processing

Gender dimension

Gender research shows a majority of plant species and varieties used for food and medicine are conserved and managed at household level by women (Balakrishnan, 2000; Gurung, 1997). Women of most tribal communities feed their families with food from the forest or the nearby wilderness in many parts of the tropical world. For those tribals who are in the dense forest areas of India, most of the food comes directly from the forests. Food from trees is sometimes a staple: more frequently, however, it is needed as a supplement for dietary diversity and nutrition. The role of gender in enhancing food security has been a major topic of discussion in recent years (Price, 1993; Kanvinde, 1999). Many authors have attempted to understand the roles, responsibilities and relations of women and men in collection, processing, cooking, consumption and management of various food species available to them in the wilderness. Report from Kanvinde *et al*., (2001) shows women are responsible for all the leafy greens collected, processed and cooked. Borjas, (2001) argues women's ability to conserve biodiversity and influence the way that others conserve is eroding rapidly. The author cites several reasons for this - dwindling of forests and other land resources that women depend on, introduction of cash crops and modern varieties that displace the traditional crops, out- migration of males from rural areas that leaves women to manage agriculture without access to labour and other such critical resources, erosion of women's rights to private land and the disparagement of their native diets. Though the reasons for women's reduced ability to conserve biodiversity are broadly understood and a clear understanding about the gender roles in collection and processing of wild food exists, yet, in the Indian context little is known on how the gender relations over a period of time are related to the conservation and management of food species.

Access to biodiversity and other natural resources vary across communities and the quality and quantity of those resources often has a critical effect on the well-being and even survival of people

Sourcing information

all over the world. In many cultures, such access is determined by gender-based differences in knowledge about natural resources and ways of using them, which vary from country to country and village to village, and depend on traditions and environmental, social and economic circumstances.

An understanding of gender issues in plant and animal biodiversity requires a look at the different roles and relations of men and women as part of their overall livelihood systems that comprise farms and gardens, common property resources such as pastures and forested lands as well as protected areas. An understanding of such gender-based differences is essential to understand and estimate the contribution of women towards sustainable forest management. For example, by defining the resources or products that a local community extracts - who collects these resources? how? why? how are they controlled, managed and used? and by whom? - the effects on men and women can be better understood. Through their different activities and resource management practices, men and women have developed different expertise and knowledge regarding the local environment, plant and animal species and their products and uses. These gender-differentiated local knowledge systems play a decisive role in the *in-situ* (in their natural habitat/ecosystem) conservation, management and improvement of genetic resources for food and agriculture. The decision on what to conserve depends on the know-how and perception of what is most useful to the household and local community.

Wild food production not only involves labour at the time of harvesting but, more importantly, calls for knowledge of the various types of food that are available in different seasons and their distribution over given geographical area. The burden of wild food collection accentuates when these food items become the major part of the diet as during periods of food scarcity and famine, especially when the food need to be foraged at great distances from the home.

Why this study ?

For many years the importance of wild food plants and animals in subsistence agriculture in the developing world as a food supplement and as a means of survival during times of drought and famine has been overlooked. Generally, the consumption of such 'wild food' has been and still is being under estimated and research, particularly concerning the socio-economic, cultural, traditional, and nutritional aspects of wild-food plants still lacks adequate attention. Further, there is little information on the distribution and the consumption pattern of the wild foods of different communities in different landscapes.

There is a need to document, describe and publish information on wild foods to enable specialised research on the nutritional values of these plants. This potential resource can be discovered and improved so that one or the other wild-food plant may become a future indigenous staple food crop that may ease food insecurity. Wild food plants should be considered as a serious issue when developing

strategies to fight rural food insecurity and propose integrated development programmes for chronic food-insecure areas of the world. The option to improve food production through exploiting the potential of wild food plants is a naturally sustainable, cheap and locally available alternative to resolving at least part of the food shortage problem. At the same time, an emphasis on the development of wild food plants will help enhance and maintain biodiversity. Historically, Indian forest policies have alienated people from the forests, thereby exacerbating the rates of deforestation. Post independence forest policies tightened the control over forestlands through restricted access to forests and forest products (Haeuber, 1993.) Production policies increased the hardship of vulnerable social groups by denying them access to forests (Barraclough & Ghimire, 1995). Before Government intervention, forests were managed as community property, and the crucial role of forests in the economic subsistence of the individuals, families and community was the basis for managing them as communal resources (Chopra *et al.*, 1990). A shift of property rights to the state steadily undermined the rights of tribals to use and extract forest resources.

The consumption of wild plants seems more common and widespread in food insecure areas, where a diverse kind of species is consumed. Many tribal and rural families of Wayanad district in Kerala still conserve a wide range of plants for their food needs. For certain communities among them, the consumption of wild-food plant seems to be one of the important local survival strategies and many of these species are not just consumed during periods of drought, food scarcity and other hardships but also forms part of their regular dietary intake. Kanvinde *et al.,* (2001) reported the food use of about 229 taxa by 5 different communities from this district. The significant contributions of rural and tribal families, particularly women, to the conservation, selection and enhancement of biodiversity have by and large remained unrecognized and unsung in this state. Also these wild food species are hitherto under-researched. This research aimed to address this gap and was designed specifically to focus on the gender dimensions of wild food conservation - the changes in the roles, relations and responsibilities of men and women and the consequent changes in the management and utilization of wild food resources by different socio-cultural groups in Wayanad district.

The objectives of the study were:

- Better understanding of the trends in wild food management mechanisms in terms of community, gender and age.
- Correlating people's knowledge with the existing scientific understanding on different wild food species.
- Inter alia, as a long term objective, the study aims to facilitate context-specific people's plan for the sustainable use and development of wild food aimed at improving the quality of life of dependent communities.

This report gives information on 343 wild food species (mammals and birds are kept outside the scope of this study) used by four different socio-cultural groups- three tribal communities and a heterogeneous non- tribal group. A detailed picture of the knowledge and skills of both men and women of these communities in managing various food species is attempted here. Information on the location and landscapes where such species are seen is also provided. The study discusses in particular how the gender relations and role differences among these communities affect the management of wild food diversity and food security at the household level. The changes in gender relations and its impact on food species management also come under the purview of this study. It has also tried to take on board the perception of both males and females of different age groups about the structure, function and dynamics of the agricultural landscapes vis-à-vis availability of the food species. It is hoped that this study will provide the impetus for initiating community-specific people's plans for the wider use of select wild foods for poverty reduction programmes.

Chapter 2

Methodology

The study began in June 2001 and was completed in three phases: The first phase, lasting about two months focussed on evolving a methodology for the study. The wild food types, communities, and locations that were to be brought under the ambit of the study were finalised through discussions. Subsequently a work plan, including methods to be followed for data collection and literature survey were arrived at. This was followed by a field level testing of the methodology in the surroundings of Community Agrobiodiversity Centre, Kalpetta. The second phase of the study involved extensive field survey and data collection lasting through all the seasons of one calendar year from August 2001 to July 2002 . The final phase of approximately two months was spent in analysing the information and validating and exchanging the study findings with key 'knowledge holders' from the communities.

The methodology emphasised on the following research rigour:

- Open & participatory approaches to be the guiding principles both in the formulation of the study plan as well as in sourcing information and validating the same.
- Gendered to establish the nature of linkage of men and women with biodiversity.
- Emphasis on the qualitative dimension, supplemented with the required quantitative data.
- Accent on retaining people's own language and categories in data collection.
- Focus on community-specific contexts.
- Collation of information from primary and secondary sources and analysis.

The study focussed on seven major groups of wild foods such as leafy greens, tubers, mushrooms, fish, crabs, honey, fruit and seeds.

Socio-cultural groups

The study sought to focus its attention on the wild food management practices of three prominent tribal communities of Wayanad, namely the Paniya, the Kattunaikka and the Kuruma. The Paniya are predominantly a landless group working as wage labourers and living close to agricultural landscapes, particularly the paddy fields. The Kattunaikka are traditionally a food-gathering tribe and live close to the forests. The Kuruma are a settled community, engaged in agriculture. Parallely, a comparative study has also been made of the non-tribal Hindu, Christian and Muslim communities to observe the differences in their approach to and pattern of wild food resources conservation and utilization. Among the non-tribal groups special attention has been given to the Wayanadan Chetty community who live close to forests and follow traditional paddy cultivation.

Study sites

In a broadsweep classification limited to the purpose of the study, Wayanad district was broadly divided into two ecological zones - Wet & Dry - based on rainfall, climate and vegetation. Of the five study sites chosen 4 were selected from the wet zone and one from the dry zone. Each of the study sites fell in a different Panchayat (the grassroot rung of the three tier local self government formation in Kerala). Preference had been given to wet area because of the greater concentration of tribal communities in this part and its richness in terms of biological resources compared to the other region. From these five sites, fifteen locations (hamlets) were selected out of which eleven fell in the wet climatic area and four in the dry part (Table 1). The study site at each of these locations were selected at random using a grided map of the district. The target groups selected were the users of wild food in

Table 1: Profile of the study sites

Ecological zone	Area	Location	Socio-cultural groups	Land use (main	Land use (subsidiary)
WET	Kalpetta	Puthoorvayal	Paniya	Paddy field	Forest, streams, plantation
		Puthoorvayal	Kuruma	Paddy field	Forest, streams, plantation
		Puthoorvayal	Hindu	Paddy field	Plantation
	Pozhuthana	Mutharikkunnu	Paniya	River	Paddy field, plantation forest
		Mutharikkunnu	Muslim	Plantation	River
	Banasuramala	Bhappanammala	Paniya	River	Forest, plantation
		Bhappanammala	Kattunaikka	Forest	River, plantation
	Chooralmala	Attamala	Paniya	Forest	River
		Aranamala	Kattunaikka	Plantation	Forest, river
		Elavayal	Christian	Plantation	River
		Chooralmala	Muslim	Plantation	River
DRY	Muthanga	Ponkuzhy	Kattunaikka	Forest	River, paddy field
		Kumizhi	Paniya	Forest	River, paddyl field
		Kumizhi	Wayanadan Chetty	Paddy field	Forest, river
		Thakarapady	Kuruma	Paddy field	Forest, river

Table 2: Landscapes and seasons

Landscape	Local name	Season for food collection
Forests	Kadu / Mala	Manjukalam and Venalkalam
Thickets	Kuttikadu / Ponthakadu	Edavapathy and Thulavarsham
Plantations	Thottam	Edavapathy and Thulavarsham
Paddy fields	Vayal / Kandam	Through out the year
Streams / Rivers	Aruvi / Thodu / Puzha	Venalkalam
Streamsides	Thodariku / Puzhayariku	Through out the year
Swamps	Chathuppu / Kolli	Through out the year
Waysides	Vazhiyariku	Edavapathy and Thulavasham
Open areas	Thurannasthalam	Edavapathy and Thulavarsham

the region. The relatively greater dependency of the Paniya community on wild food was reflected in the selection of five Paniya settlements in the target group. One Kattunaikka colony from the dry zone and two from the wet zone (among which is an economically well off group in Aranamala) were included. As lifestyle and wild resource dependency is uniform among the Kuruma, one colony each from the dry and wet zones was selected. Five locations were surveyed in parallel to cover the non-tribal communities selected for this study.

Different landscapes and seasons covered under the study

The main landscape elements (LSE) that the tribal and rural people of Wayanad access for food in different seasons are moist forests, thickets, natural wetlands, paddy fields, streams/rivers and plantations (Table 2). The popular classification of seasons adopted by the local people have been retained in the study: The South West Monsoon spread from June through September is popularly referred to as 'Edavapathy or Kalavarsham' . The North East Monsoon spanning the months of October and November are referred to as 'Thulavarsham'. (The common reference to both these rainy seasons of the year is Varshakalam). The winter months of December to February are referred to variously as Manjukalam/Thanuppukalam/ Kulirukalam' and the summer months from the beginning of March lasting through May is the Venalkalam or Choodukalam'.

Data collection

A fairly comprehensive survey and review of the available literature on wild foods preceded field level

Landscapes - Wayanad

Table 3 : Total number of informants

Site	Informants - age wise											
	Paniya			Kattunaikka			Kuruma			Others		
	*C	*A	*O	C	A	O	C	A	O	C	A	O
Puthoorvayal	12	8	9	-	-	-	10	15	12	10	10	10
Muthanga	9	6	7	12	15	16	10	12	12	5	6	7
Banasuramala	8	7	9	8	7	8	-	-	-	-	-	-
Pozhuthana	12	8	15	-	-	-	-	-	-	4	5	5
Chooralmala	-	-	-	-	-	-	-	-	-	12	8	12
Attamala	-	4	6	-	-	-	-	-	-	-	-	-
Aranamala	-	-	-	8	5	6	-	-	-	-	-	-
Total	41	33	46	28	27	30	20	27	24	30	29	34
		120			85			71			90	
Key informants		20			20			20			20	

* Age groups- C= <15, A= 16 to 40, O= 40< • Total number of informants = 366 • Key informants = 60

data collection. The tools used for primary data collection included both Survey and PRA methods. The specific tools deployed were:

- Survey
- Questionnaires
- Individual interviews
- Transect walk with key knowledge holders
- Resource mapping
- Personal observation and
- Focus group discussion

Personal interview

Transect walk with key informants

A total of 362 knowledge holders (men, women and children) of different age groups were directly interviewed during the study (Table 3). The data collection attempted to enumerate and categorise the wild species of the area used as food, the gender dimensions of its management and the level of knowledge difference in terms of age, social status and income. The researchers along with the field assistant visited each location, meeting at least 25 families from each socio-cultural group at timings that were convenient to the community, often camping in certain remote locations for a few days. The interviews / discussions were carried out either in gender specific groups or in mixed gender groups. The discussions were held in the local language – Malayalam. People who seemed comparatively more knowledgeable from among the group were contacted individually and in-depth interviews were held with them. Informal discussions with the community often provided leads to individuals with specific knowledge about wild food and its management. From each community 20 such key knowledge holders (KHs) were selected for sourcing more detailed and in-depth information (Annex.6). The selection of Knowledge Holders often followed a

Information validation

pattern of one knowledge holder providing information leading to another.

Separate transect walks were undertaken with men and women of three different age groups viz., above 40, 15 to 40, and below 15, in order to identify the species of food value, management measures, changes in gender relations and its impact on food collection and management practices. To assess the seasonal availability of different species of wild food, the same exercise was repeated in all the four seasons. During these exercises the details of various species of wild food including name, parts used, mode of utilisation, nutritive value, seasonality as well as abundance and rarity according to locations and seasons were recorded in a data book specially prepared for this purpose. This exercise helped in validating much of the field information on the species used and threw light on the wealth of knowledge and skills the communities had in identifying various taxa, even those that closely resembled each other. The rapport of the study team with the communities proved crucial in eliciting information in a non-extractive manner, even as the trekking turned out to be an enjoyable event for the mixed group of men, women and children.

For collection of the plant samples, a series of transects were used at random covering various landscapes with in an average radius of 3-5 kms of the habitations in all the 15 locations. Specimens were collected for both herbarium and *ex-situ* germplasm collection. Detailed information about the availability of different wild food species, people's preferences of one species over another and the gender difference in its collection and processing was gathered over 6 to 8 visits to each site and through in-depth interviews with 20 to 25 key knowledge holders from each socio-cultural group. The relevant information about all the key knowledge holders was recorded meticulously in acknowledgement of their contribution to the study and in recognition of their rights as holders of traditional knowledge. At the end of ten months of data collection, the exercise of validating the findings was carried out supplemented by occasional field visits. It was observed during the field study that different socio-cultural groups have different names for the

same wild food species; also wet and dry zones had different nomenclature for the same plant or animal. Thus it became imperative to validate the identity and information about different species through group meetings with key knowledge holders. Five such meetings were conducted at the research station. *Ex-situ* collections, herbarium specimens, wet collection of mushrooms and fish etc. were shown to them to verify the respective names. Reference books on fish and flora were also used to facilitate identification.

Case studies

Accessing and consumption of wild food by different communities of the region remarkedely vary. The social values held by the community and the gender roles prevalent in it have a significant bearing on the manner in which wild food is conserved by the community for food security and livelihood. The case studies that bring to the fore these dimensions have been mainly focussed on the Paniya community who are seen to be comparatively more dependent on wild food for their livelihood.

The case studies of selected households done through in-depth interviews with key knowledge holders, focus group discussions and other interactive methods have sought to elicit more qualitative information than was possible through the structured questionnaires. Different case studies have been conducted to get an in-depth idea about aspects like marketing of wild foods, the situation and perception of isolated subgroups within a community in terms of wild food use and its management and changes over a time in gender relations and its relation to conservation and sustainable use of Plant Genetic Resources (PGR) etc. An observation guide with the questions asked in the field was prepared and followed systematically while collecting information. Information gathered through interviews and observations was validated by crosschecking with several individuals of the same communities within and across the locations. Besides, informal and unstructured interviews, in-depth interviews were also made to understand the gender dimensions involved in the collection, processing and management of wild foods. To get baseline information on communities a questionnaire survey had been conducted, leading to a socio-economic profile of the communities.

The information gathered was compiled primarily in the form of reports, inventories, seasonal resource use pattern charts, daily work calendars and photos. A key output of the research was a database on wild food that are distributed in the study areas of Wayanad and consumed by the communities . The database has information on: the wild plants available in this region (vernacular and the scientific names), seasonal availability, consumption patterns, extent of domestication and a break down of which household members collect and consume the food. Photographs are also available.

Structure of the report

The report consists of six chapters and five appendices. The introductory chapter gives the background and describes the objectives of the study and also provides some background to issues of wild resource use in the region. Second chapter gives an overview of the methodology used and the research questions addressed. The third chapter gives a detailed study area profile and community profile. The fourth chapter provides detailed results from the locations studied. This chapter captures the details of different wild food groups - their locational spread, the communities that access wild food at different seasons followed by an appraisal of gender roles in harvesting and processing of the wild foods. Chapter five provides a more general synthesis of the role of wild foods in the lives of the socio-cultural groups at times of emergencies and food famines and also records the diversity of wild foods that are used for the sustenance of the tribal communities habituating two different climatic zones-wet and dry. The final chapter elaborates on the key learnings and recommendations of the study.

Chapter 3.

Profile of study sites

Study area profile

Wayanad is a hilly terrain in southern Western Ghats and lies at an altitude of 750 m. above main sea level (MSL). This district (ca.2136 sq.km in size) contributes significantly to the foreign exchange earnings of the state through its cash crops like pepper, cardamom, coffee, tea and other condiments like ginger and turmeric. The nearest major town and trading centre is Calicut located about 76 k.m. away from the district headquarters, Kalpetta. The district is unique for its rich wealth of flora (earning it the sobriquet 'green paradise') and for the diverse ethnic cultures that inhabit the land. The name Wayanad is said to be derived from 'Vayalnadu' meaning land (Nadu) of paddy fields (Vayal) (Figure 1 & 2).

A short history

Historians are of the view that organized human life existed in Wayanad at least ten centuries Before Christ (Johny, 1988). The stone carvings in Edakkal Caves – the twin caves in Ampukuthimala near Ambalavayal - provide strong evidence of human habitation dating back to the period of the New Stone Age civilization. Recorded history of this district is available from the 18th century beginning with the rule by the Rajas of the Veda tribe. In later days, Wayanad came under the rule of the Pazhassi Rajahs of Kottayam royal dynasty. When Hyder Ali became the ruler of Mysore, he invaded Wayanad and brought it under his sway. Though in the days of his successor Tipu Sultan, Wayanad was restored to the Kottayam royal dynasty, the Sreerangapattanam truce that Tippu made with the British lead to British hegemony over the entire Malabar region, though only after facing fierce encounters from Pazhassi Raja. The British domination changed Wayanad's historical trajectory particularly after it opened up the plateau for cultivation of tea and other cash crops. Roads were laid across the dangerous slopes of Wayanad, from Kozhikode and Thalassery. These roads were extended to the cities

of Mysore and Ooty through Gudalur. Through the roads poured in settlers from all parts of Kerala and the virgin forestlands proved a veritable goldmine with in credible yields of cash crops (Johny, 1988; Department of Public Relations, 1997).

Ecological profile

Placed on the southern tip of the Deccan plateau, its prime glory is the majestic Western Ghats, with lofty ridges interspersed with magnificent forests, tangled jungles and deep valleys (Figure 3). In the center of the district, the undulating terrain does not acquire much altitude (ca.750m.) while the southern and western boundaries are dotted by lofty hills. Some of the major mountain peaks are Vellarimala, Banasuramala, Brahmagiri and Chembra, ranging in height from 1,500m. to 2,100-mts. The eastern side is flat and open (Figure 4). Due to this peculiar terrain, there are east flowing and west flowing rivers in Wayanad. The low altitude hills are filled with plantations of tea, coffee, pepper and cardamom while the valleys have a predominance of paddy fields. From the highest altitude of the Western Ghats on the western border

Fig. 1. Wayanad district map

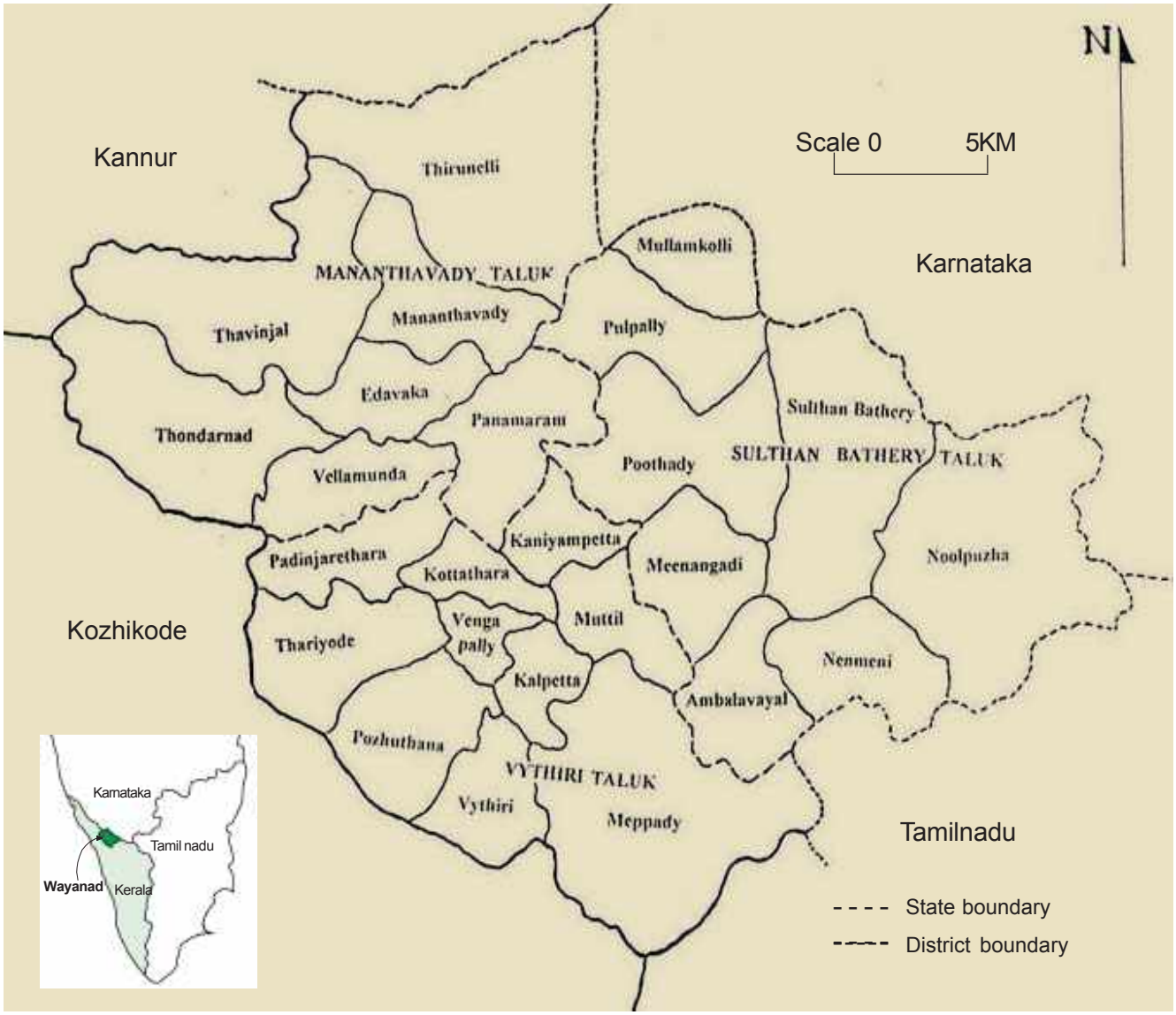


Fig. 2. Wayanad district map - wet and dry zone

of the district, the plateau of Wayanad gradually slopes down eastward. Further from Mananthavady, it becomes a common plain of paddy fields with the swift flowing Kabani coursing through it.

Forests

According to the classification of Champion & Seth, (1968) the following types of forests exist in Wayanad district.

Fig. 3. Wayanad - wet zone landscape profile

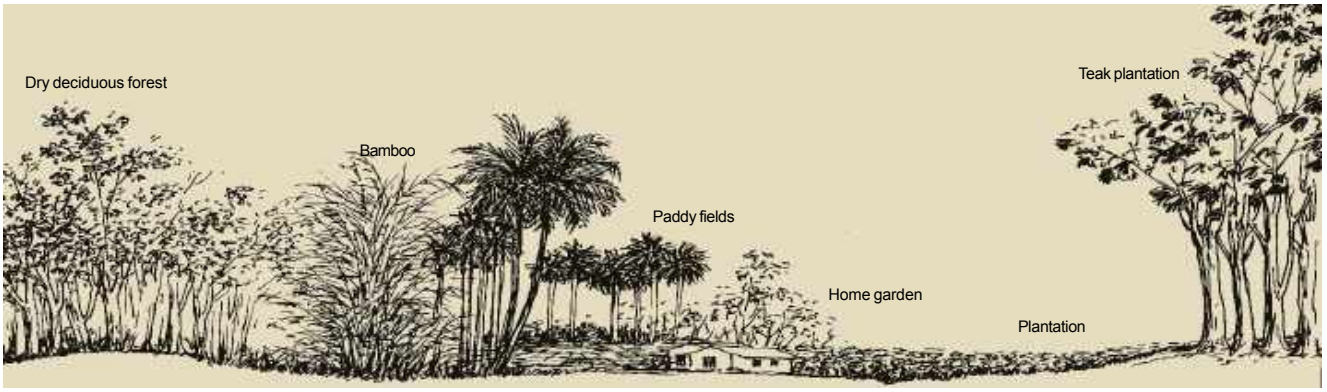


Fig. 4. Wayanad - dry zone landscape profile

Tropical group

- Tropical wet evergreen
- Tropical semi-evergreen
- Tropical dry evergreen
- Tropical moist deciduous
- Tropical dry deciduous

Sub-tropical group

- Sub-tropical broad leaved hill
- Nilgiri sub-tropical hill

Climate, soil, water

Wayanad has a wide variation of climates and seasons and receives abundant rainfall. The soil resources vary by region and consequently the crops, forest types and natural vegetation. These variations bestow the land with a rich natural endowment of biodiversity. The mean average rainfall in this district is 2322 m.m. Lakkidy, Vythiri and Meppady are the high rainfall areas in Wayanad. Annual rainfall in these high rain fall areas range between 3,000 and 4,000 m.m. High velocity winds are common during the south west monsoon while dry winds blow in March-April. High altitude regions are comparatively cooler climes, with the mean maximum and minimum temperature in Wayanad for the last five years being 29^0 C and 18^0 C respectively. The region experiences relatively high humidity, which can go up to as much as 95 per cent during the southwest monsoon period.

It is customary to classify the year into four seasons: the cold season of Manjukalam spans December to February; the hot months of March to May are called Venalkalam; Edavapathy refers to the southwest monsoon starting from the beginning of June and stretching often to September and close on the heels is Thulavarsham -the northeast monsoon during October and November.

The soil of Wayanad is mainly of the forest type. On the plateau, the top soil is rich clayey loam, generally 0.75 to 2.5 m deep with a red gravelly or yellowish clayey sub-soil layer of considerable depth. It promotes a luxuriant growth of vegetation, which makes Wayanad clothed in uniform greenery.

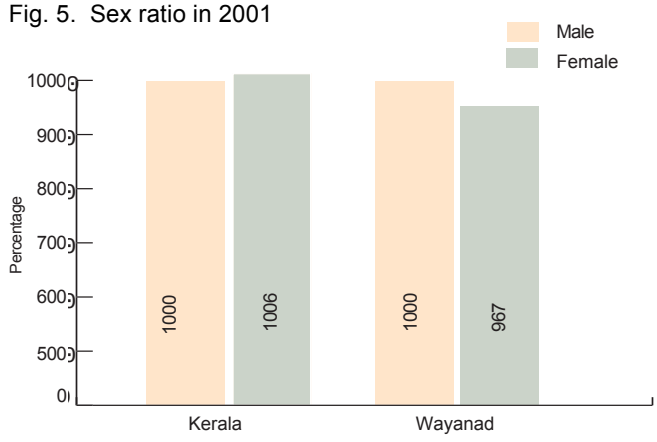
The east flowing rivers of Wayanad are in striking contrast to the various rivers of the rest of Kerala. The Panamaram river, originating from Lakkidi and the Mananthavady river originating from Thondarmudi Peak, meet six kilometers north of Panamaram town and after the confluence, the river is known as Kabani, which is a perennial source of water to Cauvery. Kabani and its tributaries constitute a powerful river system in the landscape of Wayanad.

Social and cultural profile

Wayanad's population counts 7,86,627 people with an average of 316 persons per sq.k.m. (2001 census). The tribal population contributes 17%, which is the largest in the state of Kerala. The female- male sex ratio is 967 per 1000 males (Figure 5). The average per capita income is about Rs. 5263 (1992-93) but the figure can be quite misleading about the real economic situation of several communities, especially the tribals who lag far behind this average. Conversely, the planters with sizeable holdings fare far better than what the average per capita implies.

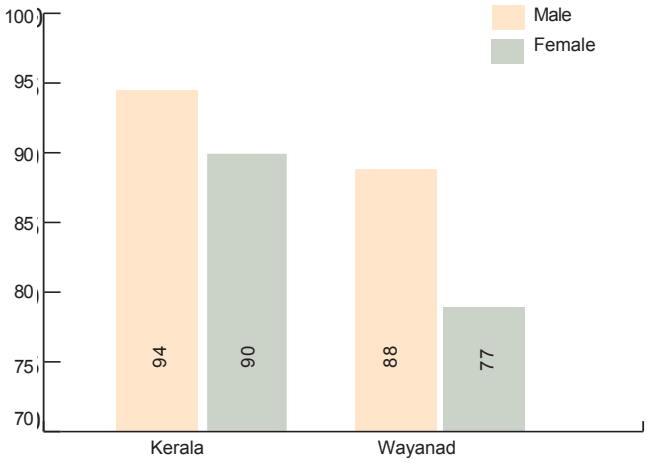
The literacy rate in the region is 85.64%. The male literates number 2, 55,679 and female literates are 2,18,933 (Figure 6). There are 266 schools in Wayanad including a residential upper primary school at Muthanga and a residential high school at

Fig. 5. Sex ratio in 2001



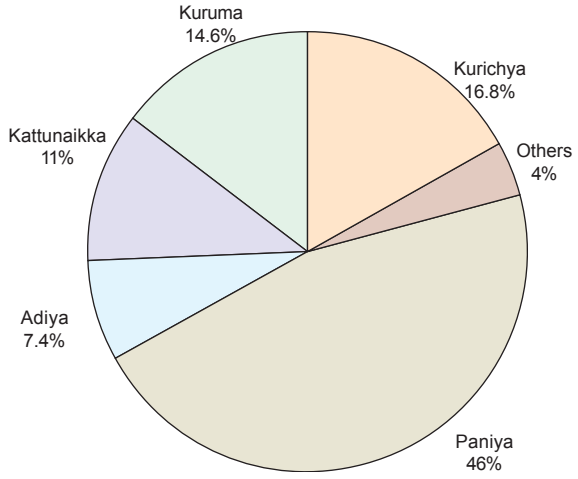
Nallurnadu for Scheduled Tribes. Out of 1, 38,339 students studying in these schools, 69,944 are boys and 68,395 girls. Of the total 2, 27,453 workforce, 53,773 are women. The cultivators number 40,729 of which only 4,666 are women. The total number of agricultural labourers are 74,813 of which 26,907 are women. 33,558 persons educated up to 10th standard are jobless while those who are educated above 10th standard and are unemployed number 32,803.

Fig. 6. Literacy rate by sex as on 2001



No one religion is predominant in the district; the major religious groups of the state are all more or less equally represented. The ethnic diversity of the district is very impressive as evidenced by five dominant tribal groups-Kurichia, Kuruma, Paniya, Adiya and Kattunaikka. Among them the Paniya community is the largest, which constitute 46% of the total number of tribals (Figure 7). These are the communities who still hold knowledge on bio-diversity and follow traditional conservation practices. A small representation by way of the Gounders who came from Karnataka constitute the Jain community of Wayanad, many of whom are planters with sizeable holdings. Christians who are the single largest religious group constitute one fourth of the population. They are primarily settlers who immigrated from Travancore area of south Kerala. Muslims who constitute another near one fourth of the population are the 'Mapilas' who have come from Malappuram and Kozhikodu districts. A large number of them are agricultural labourers and Muslim women labourers are a common sight here.

Fig. 7. Relative abundance of different tribal communities in Wayanad district



Hindus of different castes like Nairs, Thiyyas, Wayanadan Chetty, etc. who settled here from different parts of Kerala, form the rest of the population.

Biological profile

The biological diversity of the district is substantial at all levels-habitat, species and genetic- and with an impressive rate of endemism in all forms of life. The richness of the plant diversity in this district is evidenced by the occurrence of more than 2000 species of flowering plants, equal number of fungi, more than 1000 species of other lower plants, and several other animal species. Flowering plants include more than 15 Red Data Book Species like *Ipsea malabarica, Hedyotis wayanadensis, Cynometron bourdilloni* etc. The rich diversity in plants has produced large number of plants of immense economic value. Among them are medicinal plants, spices, food plants and ornamental plants. Over 600 species of plants are used in the indigenous systems of medicine, including Ayurveda and several streams of tribal medicine, which are widely

practiced in the district. A number of cultivated food plants have their wild relatives like *Vigna vexillata, Artocarpus heterophyllus, Dioscorea oppositifolia,* etc. Among spices, black pepper, cardamom, cinnamon and curcuma have their wild relatives largely in wet forests.

The district supports a high faunal diversity due to its wide-ranging variations in geographical features and ecosystems. The extensive forested areas and different vegetation types enable the existence of terrestrial, aquatic, and avian fauna. With the clearing of large tracts of forests, the diverse animal life, characteristic of the forests of Western Ghats, has shrunk. Yet, one can still see the bonnet monkeys, ioris, mongooses, jungle cats, squirrels, jackals, hares, elephant, bear, tiger, etc. in the forests and plantation areas.

Agricultural profile

The district has an area of 1,13,000 ha. agricultural land, of which 1853 ha. is uncultivable; horticultural crops are in about 16756 ha., and cash crops in 65469 ha. The recorded area of paddy in 1992 was 21660 ha. but would have obviously shrunk since, given the furious pace of conversion of paddy fields to other uses. More than 50% of the total cultivable land is used for raising cash crops like coffee, tea, rubber, ginger, cardamom, and arecanut. Homestead farming assumes crucial significance in the district, with the average size of holdings at 0.68 ha. A variety of crops including annuals and perennials are grown in these small holdings. The crops include coconut, arecanut, pepper, vegetables, tuber crops, drumstick, papaya, and fruit trees like mango and jack.

The agricultural activities and developmental schemes coupled with population pressure on all the human inhabited areas of the district have resulted in the continued destruction of characteristic landscape features, habitats and associated biological diversity. To add to the problem, species invasion and introduction, particularly of the exotics in the name of greening, soil protection and augmentation of the forest cover have further threatened the native flora often by directly altering the habitat features.

Community profile

Paniya

The Paniya constitutes the single largest Scheduled Tribe in Kerala and are mainly found in the Wayanad District and the neighboring areas of Karnataka. They have a distinct language of their own, closely related to Malayalam. There is a theory that the Paniyas were brought to Wayand by the Gounders who trained them to be agricultural laborers in their fields (Thurston, 1909). The center of the bonding contracts was the famous temple of the regional Mother Goddess of the Valliyoor Kavu shrine near Mananthavady. It was a practice until recently to 'buy out' the Paniya labourers by advancing loans to them at the annual festival at the shrine in the last week of March, in return for which the Paniya would pledge himself as well as the members of his family to work for the creditor for the year, i.e. until the next festival. They would be accommodated on the lender's farm premises, and would be paid minimum wages for work. It was a practice for the Nair landlords to appoint a headman called 'Kuttan' at every settlement. It was only in 1975 that the Bonded Labour System was abolished by a Central enactment and the immediate impact was misery for the Paniya families, as several landlords denied them work and wages.

Paniya woman

The community, almost entirely, depend on wage labour in the paddy fields and farms of the land own-

ing classes for their livelihood. When the British began setting up tea and coffee estates, the Paniyas came in handy to them to be employed as cheap labour.

Traditionally, the Paniyas were settled in the drier parts of the master's estates or along the fringes of vast paddy fields; as they could be contracted anew by another master at the next Valliyoor Kavu festival. The huts were generally single roomed. The walls were of bamboo wattle plastered with mud, while the roofs were of bamboo, thatched with paddy straw or grass. The corner of the back veranda sufficed for women in their periods, and girls at menarche. They are non-vegetarian, but generally avoid beef. There were Paniyas who earlier avoided eating from Christian and Muslim homes for the same reason. In the past, before strict protection of wild life was enforced in the forest, they used to trap and eat small animals, including monkeys and mongoose. They catch fish from Wayanad's abundant number of rivulets and streams and a major source of animal protein is the land crab, with which they make a delicious chutney.

Marriages take place after the girl attains puberty. The boy's brother- in- law usually takes the initiative; he is known as Munnein. At his first visit to a prospective bride's house he does not go beyond the front Veranda; if well received, he repeats the visit and broaches the subject with the girl's parents. If the proposal is accepted, a third visit ensues, when the Munnein is accompanied by the boy's paternal aunt and other female relatives. They present some ornaments and a small sum to the girl, which is called Atayalmkodukkal. After this, the boy formally visits the girl's house carrying with him firewood and household appliances. This customary style of match making is now becoming the exception rather than the norm (Sunil, 1994; Singh, 1994).

Katttunaikka

The Kattunaikkas are referred to variously as 'Jenu Kuruman', 'Tenu Kurumban' and 'Naickan'. The term Kattunaikkan has been derived from the word 'Kadu', meaning forest and 'Naikkan', meaning leader or headman. The community is now predominantly distributed in the Wayanad district of Kerala.They speak the Kattunaikka dialect, which is close to the Dravidian language, Kannada. They are non-vegetarians and eat a diverse variety of meat. Rice and ragi are their staple cereals supplemented by roots and tubers. The Kattunaikka are divided into exogamous clans. Marriage between consanguine cousins is permissible and monogamy is the norm. Bride price is paid in cash and patrilocal rules of residence are followed. Nuclear and vertically extended types of families are found among Kattunaikka. The descent pattern is patrilineal and the eldest son is the successor. Women have different roles to perform in agriculture, fishing, collection of fuel, fetching of potable water and in social customs. Death pollution and ancestor worship are observed (Luiz, 1962).

Food gathering, hunting, fishing and trapping of birds and animals are the traditional occupations of the Kattunaikka, which a few of them continue to pursue to the day. A few of them are landowning cultivators. According to the 2001 census the workers constitute 46.05 % of their total

Kattunaikka family

Kuruma woman

population (51.61% males and 40.15% females). They worship trees, rocks, the sun, moon, local deities and the spirits of their ancestors. The community is privy to a rich oral tradition, folk-tales and folk songs.

The community does not appear to be very enthusiastic about formal education and the few children who reach school often drop out after the primary level. The 2001 census figures record a literacy rate of 8.63 % among the community, way below even the poor average literacy rate of 31.79 % recorded for all the Scheduled Tribes of the state.

Mullu Kuruma

The Mullukuruma, often referred to as just Kuruma (in this report the word Kuruma is used) is a Scheduled Tribe found in Wayanad and the adjoining areas of the Gudalur Taluk and Nilgiri District of Tamilnadu. They are distributed within a radius of about 30 kilometers, including the eastern part of Wayanad and the western part of Gudalur Taluk (Janah, 1994). Their language is basically Malayalam with a spattering of Kannada and Tamil words. The Kuruma settlements are known as Veedu, which can consist of anything between one to eighty houses called Peraị. The houses are arranged in a planned manner around an open quadrangle. At the center a temple house, called 'Daivapera' is built. The construction material used traditionally are mud, bamboo, timber and paddy straw for the roofing, but the practice is fast changing. The womenfolk reserve their best artistic skills for decorating the walls of the temple house with intricate drawings. Ceremonies connected with birth, attainment of puberty, marriage and death are performed in the temple house.

Agriculture is the main occupation of this settled land- owning community. The main crop is paddy, which is cultivated in the fallows and flat lands as well as on moderate slopes. Generally, each Kuruma settlement has three categories of lands, determined by the topography. The first is Vayal (wet lands), which are essentially paddy fields. The traditional rice varieties of Wayanad are cultivated by the community, among which are the famous scented varieties like Jeerakasala and Gandhakasala, along with other traditional varieties like Chennellu, Thondy, etc. The higher level lands next to the vayal are called Thottam, which support coffee, banana, jack trees, pepper, vegetables, etc. The drier lands with shallow soil are termed as Uzhavuparambu where tapioca, chillies and drought resistant varieties of paddy are grown.

In the past (about 20 to 25 years back), hunting and fishing were as important a means to garner food as agriculture; several of their religious rites and life cycle rituals prescribe the offering or use of the meat of animals killed in the hunt. They have a unique festive hunt, Uchala, held on the 10th day of the Malaylam month of Thulam, when all the male members of the settlement, including children go hunting. The kill is ceremonially cooked and eaten, after which there is dancing and singing late in to the night.

Other socio-cultural groups

'Others' represent all major socio-cultural groups- Hindu, Christian, Muslim including traditional agriculturists like the Wayanadan Chetty. Wayanadan Chettys are an agricultural community who came to Wayanad from Panthaloor area of

Tamilnadu. Over the years their dress and life style have come to closely resemble the Nair community. Muslims came to Wayanad from Malappuram, and Kozhikodu districts, Christians from Travancore area of South Kerala and most of the Hindus from Kozhikodu and Kannur districts.

Study site profile

The 15 locations that the present study covers are, in the strict sense, hamlets and its 3-5 km radial location. 5 of these hamlets belong to the Paniya community, 3 to the Kattunaikka, 2 to the Kuruma community and the remaining 5 locations are shared between the other communities. The study locations fall broadly under 5 sites, 4 of which are located with in the wet zone and one in the dry zone. 11 locations fall under the wet zone and 4 in the dry zone (Figure 8). These locations between them covered almost all landscapes of Wayanad district ranging from high altitude mountains to large wetlands and agricultural fields. The Paniya and Kuruma settlements are in the agricultural environment traversed with paddy fields, field bunds, small canals, springs, thickets and unmanaged areas like way-sides. The Paniya community is seen to utilise all these landscapes for sourcing food. The Kattunaikka colonies are found in the forested environment characterized by hills, forests, streams, bamboo brakes, grasslands and rocks. Other socio- cultural groups like Hindu, Muslim, Christian settlements are spread in the agricultural environment, but typified with large plantations of coffee, tea, areca, rubber and banana. Settlements of the Wayanadan Chettys are always found adjacent to the vast stretches of paddy fields. Details of each study location of the three different tribal communities and of the non-tribals are described below.

Non tribal women

Locations of the Paniya community

Puthoorvayal Kalappurakkal colony

This colony is situated very close to the Community Agrobiodiversity Centre of MSSRF in the Kalpetta Municipality. A total of 71 (31 male, 40 female) members inhabit 11 households confined to a meagre 10 cent of land area. Almost all the houses are tiled and the colony has a common well inside the hamlet, but for bathing and washing they depend on the stream nearby. The Kalpetta Municipality has provided two common toilets for the colony.

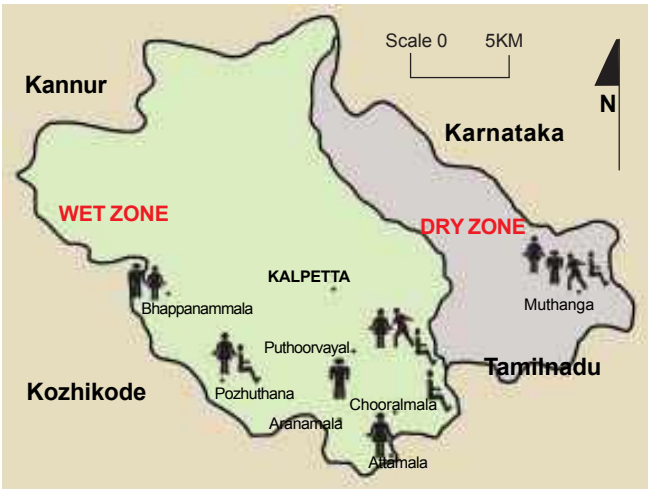
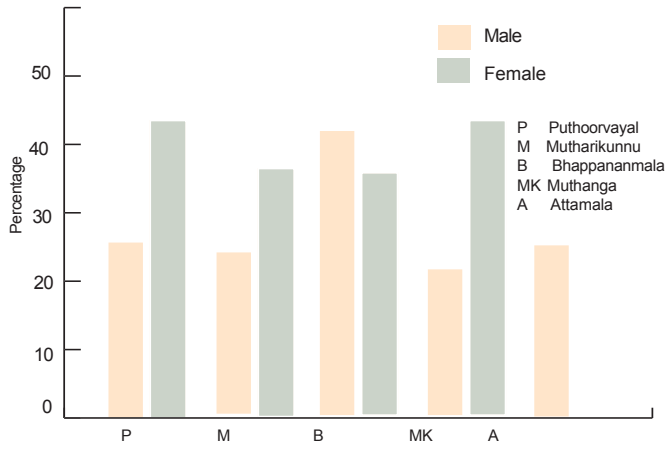


Fig. 8. Study sites

There is a sacred place inside the colony, a plat form raised around a small ficus tree. Education has not been accorded much priority by the community and almost three fourth of the members are illiterate (Figure 9). Most members in the 15-60 age group are wage labourers. The community depends on the abandoned paddy fields and associated streams in the close vicinity of the hamlet and the forests about 2 to 6 k.m. away for fire wood and wild food. The Manikkunnumala forests are located 2 kms away and the Perumthatta forests are farther off about 6 kms., both of which are accessed for tubers and fruits such as mango, amla and garcinia.

Fig. 9. Literacy rate by sex - Paniya study sites



Muthanga Kumizhi colony

Muthanga Kumizhi Paniya colony is situated in the Noolpuzha Grama Panchayath and is within the Muthanga Wild Life Sanctuary, a part of the Nilgiri Biosphere Reserve. Under the classification followed in this study, the settlement falls in the dry zone of the district. A total of 48 inhabitants live in 10 houses spread in 10 cents. They are all wage labourers and depend on the surrounding Muthanga forest for wild food and other minor forest produce. The colony has a common well inside the hamlet provided by the Panchayath. For bathing and washing, Noolpuzha river, situated a kilometer away from their hamlet is accessed. For schools, hospital and market, they depend on Muthanga or Kelloor town which is located 1.5 and 5 k.m. away respectively from their hamlet. Accessing the local market involves often a risky trek through the forest, where menacing wild elephants are often at large. Like other Paniya groups in the district almost 80% of the members are illiterate. The community's main source of income come from the collection of minor forest produce comprising of different medicinal plants and fruits like amla and garcinia, which is sold to the Tribal Co-operative Society. The main landscapes they depend on for food are the Muthanga bamboo brakes, the surrounding deciduous forests, the Noolpuzha river, marshy areas inside the forests, the plantations and occasionally the paddy fields of the Wayanadan Chettys in the vicinity of their hamlet.

Bhappanamala Ambedkar colony

Bhappanamala Ambedkar colony is situated in the Padinjarathara Grama Panchayath and is 5 k.m. away from the Banasurasagar hydel project, which submerged some of the most fertile lands of Wayanad. A total of 9 households are spread over in this area and each family has got 50 cents of land, given to them by the Government on being displaced from the submergence area of the dam. They now cultivate coffee and pepper on this land, defying the common logic that giving land to the tribals is to no avail. Almost all the houses are partially tiled. The colony has a common bore-well and the water is commonly shared with the neighbouring Kattunaikka colony members, again proving wrong the popular perception that these two communities are always at loggerheads. For bathing and washing, the Banasurasagar reservoir, about 3 k.m. away from their hamlet is used. Almost 50% of the community are illiterate, though most of the children below 15 are now studying in a residential tribal school at Kavumannam. 90% of the male members of the colony are engaged in wage labour in the coffee and banana plantations. Conversion of paddy fields have left about 60% of female workforce jobless. For wild food collection the Banasuramala forest and Banasurasagar reservoir located 3 k.m. away from their hamlet are accessed.

Mutharikkunnu colony

This colony is situated in the Pozhuthana Grama Panchayath. The colony derives its name from Muthari (ragi) cultivated on this Kunnu (hill slope), which was the practice 2-3 decades ago. The Pozhuthana river located not too far from the colony meets the water requirements of the people. A total of 15 households are spread over in this area. Most of the inhabitants are wage-labourers, except a few employed in the Sughandhari Cardamom Project- a tribal rehabilitation project set up by Govt. of Kerala. The colony has a common well, about 50 meters away from their residential area. The Panchayath has provided them a tank, fitted with a motor and pipeline which is dysfunctional. During the rainy season traditional methods of tapping rainwater for domestic requirements are followed. The Government has provided a common toilet to the colony. For bathing and washing, the Pozhuthana river, about half a kilometer from the colony is used. There is a Government Primary Health Care Center at the village headquarters in Pozhuthana town, about 3 k.m. away from the colony. Traditional customs, rituals and beliefs still hold sway on the community and the sacred place (Kaavu) holds pride of place in the colony. Almost all the houses are partially thatched and partially tiled. The members of this colony still depend on a range of wild foods like leafy greens, tubers, mushrooms, crabs, crustaceans like snail, fish, etc. For the collection of wild foods the Amba, Sugandhagiri and Vythiri forests, within a distance of 10 to 15 k.m. from their hamlet are accessed. Other landscapes they depend on are the Pozhuthana river, Perumkoda marshy area, Anothvayal paddy field, etc. which are within 5km. radius of their hamlet.

Attamala hill Paniya

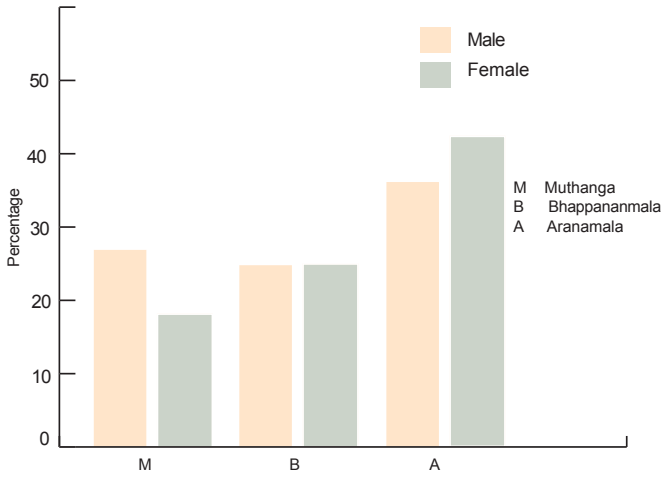
Attamala hill Paniya group comprises of 24 members, an equal number of male and female, residing deep inside the Attamala forest. The colony is made up of five small-thatched houses spread in an area of 5 cents of forest land. The nearest human habitation is 5 k.m. away, with the dense evergreen forests to be negotiated to reach it. They depend entirely on the surrounding forests for their livelihood and collect minor forest produce like honey, garcinia, tubers, fish, mushrooms, bamboo, etc. for sale in the Chooralmala market or labour colonies within the estates.

Locations of Kattunaikka community

Muthanga Ponkuzhy colony

Ponkuzhy Kattunaikka colony is situated in the Noolpuzha Grama Panchayath and is within the Muthanga Wildlife Sanctuary, a part of the Nilgiri Biosphere Reserve, and in dry zone of the district. There are around 15 families living in a two acre area who reached this location about 15 to 20 years ago from the Gundalpet forest area of Karnataka. Like all other Kattunaikka community, they habitually shifted residence from one place to another with in the forests, but have of late begun to retain permanent abodes. Even so, they continue to be predominantly dependent on the forests to eke out their livelihood. The earlier practice was to settle briefly close to the water bodies inside the forest and explore the wild for their livelihood. Since the Muthanga forests were earlier rich in wild resources they settled there and engaged themselves in slash and burn cultivation sowing finger millet (ragi) and an upland drought tolerant rice variety called 'Karuthan'. Now with slash and burn cultivation in the sanctuary forbidden, they are involved in the

Fig. 10. Literacy rate by sex - Kattunaikka study sites



collection of minor forest produce like Poopal(lichen), amla, honey and medicinal plants. The colony has a common well inside their hamlet. For bathing and washing, Ponkuzhy river, about half a kilometre away from their colony, is used. The hospital, village office and the local market, which they need to access are in the Muthanga and Kalloor towns. Illiteracy abound at 80% though 3 boys and 4 girls from among them have joined the residential tribal school. The health status of the community is indeed low and 70% of youngsters have some skin disease or other.

Bhappananmala Ambedkar colony

This colony is situated in the Padinjarathara Grama Panchayath, cheek by jowl with the Paniya colony in the same locality, mentioned earlier in the study. A total of 9 households are spread in an area of 2 acres and they cultivate coffee and pepper in this land. Houses are partially tiled and partially thatched. Similar to the Paniyas in the same colony, they were resettled here from the forest area submerged by the Banasurasagar dam. They share the common bore- well with the Paniya settlement and for bathing and washing they depend the reservoir located 3 k.m. away from the hamlet. 80% of the men go for wage labour in the plantations but regular employment is hard to come by. The community accesses the Banasuramala and nearby forests for wild food, though the dependence on wild food has now considerably reduced. Educational status of the community is low with more than 80% being illiterate.

Aranamala colony

This is a hamlet situated on the Aranamala hill slopes, which is 6 k.m. away from Meppady town, the headquarters of Meppady Panchayath**.** A total of 56 members inhabit 12 households in the hamlet. They settled here about 25 to 30 years ago, moving from the Chuluka forest area and for the past decade or so they have been engaged in the cultivation of cardamom in Government land, thanks to a tribal development scheme of the state Government. Some of the houses here are built in concrete and the rest are tiled. Water is accessed through the small pipes that stretch to its source in the shola forests uphill. Some houses have namesake attached toilets, but they mostly lie unused. 'Progress' has reared its head in the colony as evidenced by the solar panels, television sets, other electronic gadgets and transport facilities within easy reach. This relatively better off community has for themselves a smokehouse for drying cardamom; the average annual earnings from the crop for a family at the current prices would hover around Rs.50,000/-. The educational status of the colony is not too impressive (at 30% literacy rate) but it is learned that they give much importance to education and several of the children are in tribal hostels, from where they attend schools and colleges. The colony is nestled amidst the cardamom plantation, with the Aranamala forests, which is accessed for their own requirements of honey, in the backdrop. The elders (women) of the community still collect some wild leafy plants to add variety to their food, but the younger lot of the community don't exactly relish them any more.

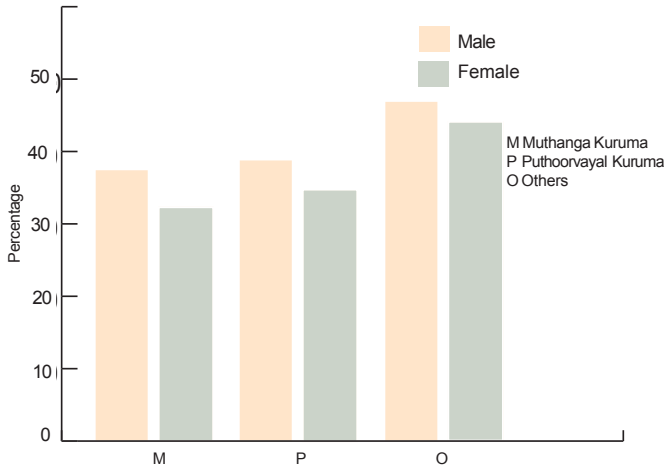
Study sites of Kuruma community

Puthoorvayal colony

Puthoorvayal tribal colony is a uni-ethnic settlement of the Kuruma tribe, displaying the features of a typical Kuruma hamlet. It consists of 13 households whose inhabitants are marginal and small-scale landowners. The community, until recently, survived cultivating their own land but today most of them work as wage labourers. The colony has 53 members, 29 male and 24 female. They depend on the three wells inside the colony and a canal cutting across their paddy fields for their requirements of potable water, bathing, washing and irrigation. The average land holding is around 1.5 acres per household.

The importance given by the community to education is reflected in the regular school attendance by the girls and boys of the colony, who invariably complete their secondary school education. Education has also earned some members of the family jobs in Government

Fig. 11. Literacy rate by sex - study sites of Kuruma & Others



services. Wild food collection is not very common now, except for the occasional greens or fish from the nearby paddy fields, plantations and the Perumthatta forests, located a couple of k.m. from the colony..

Thakarapady colony

Thakarapady Kuruma colony is situated in the Noolpuzha Grama Panchayath. They settled here about 3-4 decades ago and came from Thaloor area of the adjoining Gudalur taluk in the neighbouring state of Tamilnadu. Like all other Kuruma settlements they have two types of lands, Vayal and Thottam. Traditional rice varieties like Thondi, Chennellu and Veliyan are cultivated in the Vayal and their thottam has coffee, pepper and ginger. They access the Muthanga sanctuary forest for fire wood and to graze cattle. 70% of the youngsters of the colony are literate, a reflection of the value the community attaches to education and three are in Government service. A total of 52 members (27 male, 25 female) inhabit the dozen tiled houses in the colony. There is a common well inside the settlement. The nearest school in Naikkatty is 4 k.m. away, whereas the hospital and the Government offices are at Sulthan Bathery, 12 k.m. away from their settlement. None of the members of the colony are engaged in wage labour; both men and women work in their own paddy fields and homesteads and during the off-season go fishing in the nearby Noolpuzha river.

Study sites of non tribal communities

To compare the wild food dependency of tribals with other major non-tribal groups, a few areas of the latter were surveyed. This sample consisted of 93 persons from 32 houses of different communities, selected from the five sites spread across Noolpuzha, Pozhuthana, and Meppady Grama Panchayaths. They are, by and large, from the vicinity of the tribal communities studied, except where the tribal communities are situated in areas not easily accessible. Compared to the members of the tribal communities, they are well settled with basic comforts ensured. The educational status of these groups is at marked variance with the tribal communities, with as much as 90% being literate through formal education. This group has minimum dependency on wild food, except for some occasional game meat (secured illegally, in violation of forest laws and the Arms Control Laws!) fish, honey and fruits like amla and garcinia. Almost all households possess homestead farms which grow a variety of edible plants.

Chapter 4

Results

In the 'beginning' there was only wild food! Our ancestors collected grains, vegetables, fruits, tubers, crabs, fish, etc. from the wild for food. They hunted down animals. They learned not only the art of making them palatable but also the science to eliminate toxic substances, if any, from them. Later they settled these resources on their farms which heralded the advent of agriculture as we know it today.

The term 'wild food' is used to describe all plant and animal resources outside of agricultural areas that are harvested or collected for the purpose of human consumption. These are incorporated into the normal livelihood strategies of many rural people, be they pastoralists, shifting cultivators, continuous croppers or hunter-gatherers (Bell, 1995) and is usually considered as an additional diet to rural and forest dwelling people's daily food consumption pattern. Wild plants and animals have provided an important source of food since time immemorial (Gammie, 1902; Fernold & Kinsey, 1958; Medsagar, 1975; Bell, 1995). The wild foods used by various tribes in India have received considerable attention in the recent past (Jain, 1964; Maheshwari, 1986).

Guinand *et al.,* (2001) grouped wild food into four major categories depending on the circumstances under which different types of plants are consumed by different consumers (adults, children, women, men). His classification ran as: 'typical famine food plants', 'wild food plants with famine food components', 'wild food plants attracting additional consumer categories during food shortage periods' and 'on-farm food crops with famine food components'. Arora & Pandey, (1996) on the other hand categorized wild food into five groups based on the parts of the plant consumed, namely, tubers and roots; leafy vegetables and greens; buds and flowers; fruits; seeds and nuts. Negi, (1994) has classified the food obtained from forest into four categories - food eaten only in an emergency; wild plants gathered by people living in and around forests; food gathered from

the forest by the local people and also available for sale in rural and semi-urban market and cultivated edible forest species available for sale. Kanvinde *et al.,* (2001) have divided wild food into nine groups in their exploratory study on wild food management in Wayanad. In the present study that classification has been followed in which leafy greens, mushrooms, fruits and seeds, tubers and yams, honey, crabs and fish are studied in detail (Table-4, Figure 12 &13).

Fig. 13. Total number of wild food types used by different socio-cultural groups

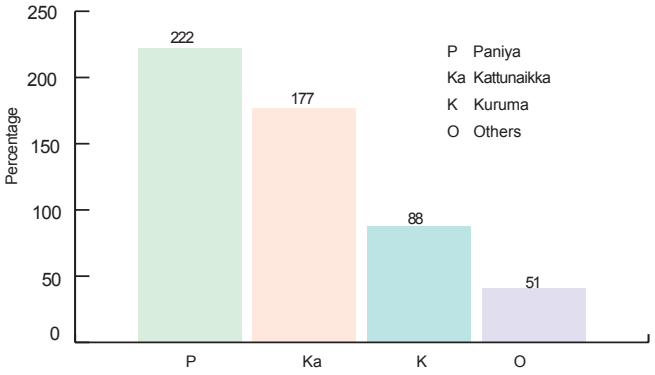


Fig. 12. Types of wild foods and their use in Wayanad

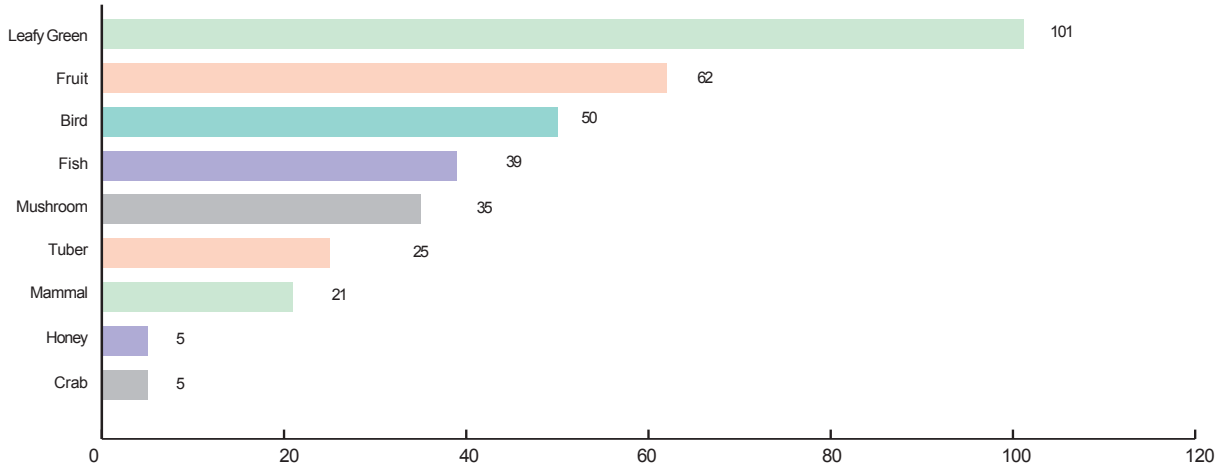


Table 4. Number of wild food species/types used by different socio-cultural groups

Wild food	No. of species/ kinds known to different socio-cultural groups						
	Paniya	Kuruma	Kattunaikka	Others			
				Hindu	Muslim	Christian	Chetty
Leafy green	83	21	43	8	12	12	14
Tuber	19	12	25	2	4	6	7
Mushroom	25	14	33	3	8	6	12
Fruits and seed	50	15	37	10	10	11	8
Crab	5	3	4	2	2	2	3
Honey	4	3	5	2	2	2	2
Fish	36	25	30	12	12	14	15
Total	222	88	177	39	50	53	61

Leafy greens

Wild leaves are among the most widely consumed wild foods. Most of the leafy wild food plants are locally referred to and classified as 'weeds', sprouting and flourishing after rains. Women use them in soups, stews and relishes that add flavor to staples. While some leaves are high in fats, others are high in protein and most are good source of vitamins and minerals.

Among the four socio-cultural groups studied, wild and weedy greens form the most regularly used food supplement in the three tribal groups and are of great dietary importance among the Paniya families. The study identified 101 wild edible greens, but only a few species are widely used. For instance, the Paniya women and children regularly collect only about eight species, the Kuruma and the Kattunaikka tribes zero in on just four such species regularly and others often make do with just three types of wild edible leaves (Table 5).

The household survey revealed that the Paniya families consume about 83 species followed by the Kattunaikka who consume 43 species, the Kuruma consume about 21 types of wild edible leaves and the settlers restrict themselves to between 8 and 14 types of leafy greens . Most of these species are herbs (90%), and very few are trees (Annexure 1). It was found that women play a key role in the collection and processing of wild edible greens. As food providers for the family, they alone, by and large, continue to posses the knowledge related to its usage. An analysis of dependency on various landscapes for collecting these plants (Fig.14) shows that wayside and open areas provide the maximum species (28) followed by thickets and forest (20 species), paddy fields and associated ecosystems

Fig. 14. Leafy green & its abudance in relation with different landscapes

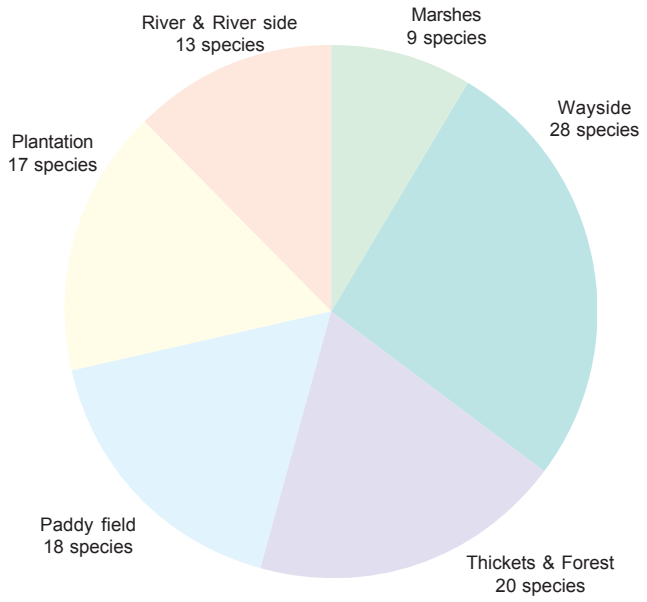


Table.5. Most frequently used greens by different socio-cultural groups

No.	Paniya	Kattunaikka	Kuruma	Others	Botanical name
1.	Ponnamkanni	Minugalasoppu	Ponnamkanni	-	*Alternanthera sessilis*
2.	Mudungachapu	-	Kattuthakkali	Chukkootti	*Solanum nigrum*
3.	Churuli	-	-	-	*Diplazium esculentum*
4.	Mullancheera	Mullukeera	Mullancheera	-	*Amaranthus spinosa*
5.	Mullancheera chuvappu	-	Cheera	-	*Amaranthus spinosa*
6.	Kalicheera	Kuppakeera	Vazhacheera	-	*Amaranthus viridis*
7.	Karinthal	-	-	-	*Colocasia esculenta*
8.	Kollithal	-	-	-	*Colocasia esculenta*
9.	-	Marakeera	-	-	*Embelia tsjeriam-cottam*
10.	-	-	-	Vasalacheera	*Basella alba*

(18), river and riversides (13) and finally the marshy areas (9).

Distribution and consumption

There is a great deal of variation in the wild greens preferred by different communities. This difference was sought to be ascertained by recording the frequency of usage of different wild greens by the different communities. Five families each from the Paniya, Kattunaikka, Kuruma, Wayanadan Chetty and Muslim communities were selected and the plants used during every week of a particular month quantified. Since most of the leafy greens are specific to the user communities, a monthly calendar was prepared according to the use pattern. The documentation among the five communities was repeated in three different seasons: summer, winter and monsoon to get the seasonal variations in the consumption of greens. Analysis of the monthly calendars from different communities shows that some plants are regularly used in all seasons (Paniya 8 species, Kuruma 5 species and Kattunaikka 4 species as vegetables). In Mutharikkunnu Paniya colony plants like Churuli, Vayalthalu and Ponnamkanni are used almost every day of the week. Species like Mudungachappu, Vellachappu and Mullancheera are used on an average three times a week. Analysis of information from other communities like Chetty, Christian, Muslim and Hindu shows sparse use of wild greens even though many of these plants used to be part of their diet, say, 20 – 25 years back. Based on the frequency of consumption by different socio-cultural groups, these edibles can be broadly classified into three groups' viz. frequently eaten greens, less frequently eaten greens and rarely eaten greens.

Among the frequently eaten greens are species like Ponnamkkanni (*Alternanthera sessilis*), Mullencheera (*Amaranthus spinosus*), Kuppacheera (*Amaranthus viridis*) and Mudungachappu (*Solanum nigrum*). The tribal communities studied consume them frequently (4 to 5 times a week). Expectedly, these species are available conveniently throughout the season near their habitations and are readily accessible to women and children. One wild species regularly eaten, which is strictly restricted to forest or evergreen bushes is Maracheera *(Embelia tsjeriam–cottam*) but it is consumed only by the Kattunaikka community.

Kattumudunga *(Lycianthes laevis)*

Greens that fall in the category of less frequently eaten are used 2-3 times a month based on their abundance, availability and accessible supply. Aliyanchappu, (*Zehenaria mysorensis*), Kattuthakkali (*Passiflora calcarata*), Kallurukki (*Scoparia dulcis*), Maracheera (*Waltheria indica*), Muthil (*Centella asiatica*), Aalanchappu (*Bidens biternata),* Kuriyankaya *(Diplocyclos palmatus*) and Kozhuppacheera (*Trianthema portulaccastrum*) fall under this category. Many of these species, except *Bidens biternata*, *Scoparia dulcis* and *Centella asiatica* do not grow in abundance near the habitations and are mostly found in the hills, often as weeds in the coffee plantations. All the three tribal communities gather these and consume them in combination with other wild food species. For example, Paniya women prefer to cook

Muthil (*Centella asiatica*) mixed with Kozhuppacheera (*Trianthema portulaccastrum*) and Kattuthakkali (*Passiflora calcarata*) with crabs or fish. The greens, according to them, tastes better this way than when cooked separately. It is however becoming increasingly difficult to fetch different varieties in a single visit and the practice is now often given a go by. Moreover, some of these greens eg. Kuriyankaya (*Diplocyclos palmatus*) need to be rather laboriously processed to remove the bitter taste and make it palatable, which itself is a deterrent to its frequent consumption. 'Children and men don't like the taste', some women said non-chalantly.

Greens like Koombichappu (*Adenia hondala*), Kayalkkalli (*Bambusa arundina*cea), Nakkuneety (*Ophioglossum reticulatum),* Kattukaipa (*Momordica dioica* and *Momordica subangulata*) Kozhivalan (*Alternanthera bidentata*) and Vattachappu (*Marselia quadrifolia*.) are greatly preferred but their consumption does not match the revealed preference. These species are seen to be not always readily available, not easily accessible and are seasonal. Species like Kattumudunga (*Lycianthes laevis*), Kozhivalan (*Alternanthera bidentata*), Koombichappu (*Adenia hondala)* and Panchithalu (*Cryptocoryne retrospiralis*) are rare in distribution and found only in the hills. Though the dishes made of these are well relished by all the members of Paniya families, their collection is now restricted to the rare forays they make in to the interior forests in search of firewood or honey.

But several of the edible leafy species, in fact a large majority of those identified, are seldom consumed, despite their abundance, availability and accessibility. Some of these are Cherukadaladi (*Cyathula prostrata*), Mukkapeera (*Mukia maderaspatana*), Chorakam (*Polygonum glabrum),* Naikkaduku (*Cleome viscosa)* and Brahmichappu (*Bacopa monnieri*). All these are species that are available nearby, but are used only when the more preferred varieties become scarce or inaccessible. The reasons for their non-popularity vary. Each community is aware of these species, but gather them only during emergency conditions. The Paniya families, for instance, know over 60 such species but use them only during times like severe monsoon when there is acute food scarcity. Some species are gathered specifically for pregnant or lactating mothers for their medicinal properties. All the communities of the study area, however, talked about such species and seemed to know their characteristics, palatability and nutritional benefits. But the values of mainstream society have seeped in enough in to the tribal community and even the famed wild leaf eaters like the Paniyas today consider it below their dignity to be seen gathering these species from the open areas.

Panchithalu *(Cryptocoryne retrospiralis)*

The women of Paniya community have learnt to use even some of the invasive species like *Bidens biternata* as greens. This plant is referred to by the non-tribals as Kandonekkuthy, for its numerous persistent calyx that latch on to the passer by when brushed against. However, the Paniya women have named it Aalanchappu in deference to it rejuvenating properties. Aalanchappu literally means leaves that rejuvenate. It is

Table 6: Leafy greens used as vegetables exclusively by Kattunaikka

Local name	Scientific name	Local name	Scientific name
Hallukkerai	*Allmania longepedunculata*	Kadukucheera	*Blumea barbata*
Kannisoppu	*Commelina bengalensis*	Koovilisoppu	*Crotalaria laevigata*
Maradasoppu	*Capparis sp.*	Hinnisan kaya	*Cattunaregam uliginosa*
Marakkeerai	*Embelia tsjeriam-cottam*	Hattakkeerai	*Justicia nilgherrensis*
Parippukkerai	*Chenopodium album*	Malankkerai *	-
Thaivasoppu	*Pteridium aquilinum*	Minugalasoppu *	-
Parippukkerai	*Phyllanthus rheedii*	Thonachisoppu *	-
Palankeerai	*Ceropegia metziana*	Panichisoppu *	-

* These species could not be collected

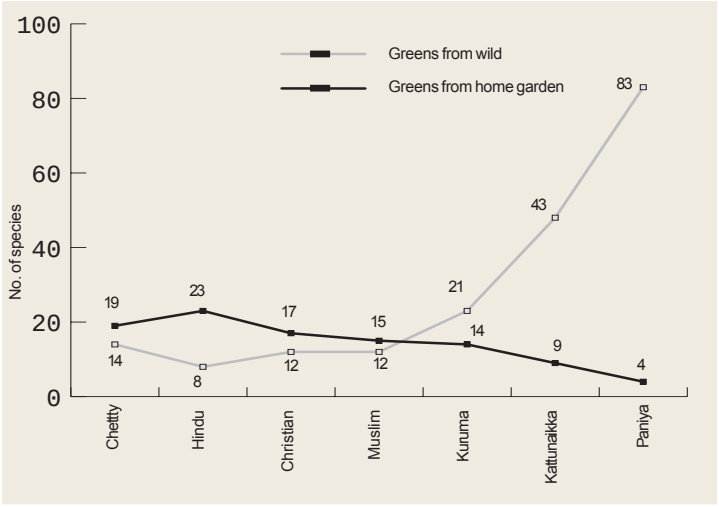
remarkable that the Paniya women have identified the rejuvenating properties of an invasive plant that the common populace considers but a troublesome weed and are using it as a delicious food supplement.

Compared to the Paniya, the Kattunaikka community use less leafy greens (43 species) and this can partly be attributed to their lower dependency on agricultural and associated landscapes. However, they regularly include several greens in their diet. Marakkeera, *(Embelia tsjeriam-cottam)* Maradusoppu (*Capparis* sp.), Kannisoppu, *(Commelina bengalensis)* and Hattakeera (*Justicia nilgherrensis*) are among the greens regularly consumed by the community. Among the 101 wild greens the study identified, 16 species (Table 6) are exclusively consumed by the Kattunaikka community. Most of these are pure forest species, which are not generally accessed by the Paniya or Kuruma women. Many of these species are highly seasonal and depend heavily on soil moisture for their growth. During summer the Marakkeera and Maradusoppu are available, where as many of the other species sprout only during rainy season. Maradusoppu and Marakkeera are available throughout the year not merely because they are evergreen shrub species but also because their use as leafy green is restricted to these communities, thus ensuring that there is no over exploitation.

Wild leafy green collection

Among the three tribal communities studied, the Kuruma women are the least dependent on wild leafy greens for their food requirements. The reasons cited for this reduced dependency range from low preference of the men and children in the family to wild leafy greens in the diet, availability/ accessibility/time constraints to perceptions that accessing wild greens for food reduces social prestige. Invariably, in all the Kuruma households, there are

Fig. 15. Number of greens accessed from wild and home garden by different socio-cultural groups



home gardens, which are maintained well by women and this may be another reason for their lower dependency on wild greens.

The use pattern among the resource poor settled communities like Wayanadan Chetty, mixed communities from the Hindu, Christian and Muslim shows the frequency of use of wild greens is very little compared to the tribal communities. The knowledge about edible wild greens among the settler communities is also much less. The study revealed that while the Wayanadan Chetty, predominantly an agricultural community knows 14 such greens, the Muslim and the Christian communities knew about 12 wild edible greens and the Hindu community knew about 8 of them. Their minimal dependency on wild greens has to do with the fact that they possess fairly well maintained home gardens and their relatively better economic status provides them better market access. A concomittant reason, of course is that it is considered below their social standing to eat wild greens, a habit only associated with the tribal communities! The species diversity in the home gardens maintained by the settler communities, it must be noted, does have a direct bearing on their wild plant dependency (Figure.15). The leaves of many of home garden species are used as greens, the most common being Mathanchappu *(Cucurbita maxima),* Muringayila *(Moringa oleifera),* Kumbalachappu *(Benincasa hispida)* and Payarucahppu *(Vigna anguiculata).* Interestingly, it is found that once in an year, in the heavy monsoon month of Karkidakam, some women of the settler communities do collect some wild greens like Mudungachappu (*Solanum nigrum*), Vankadalady (*Achyranthes aspera*), Thavara (*Cassia tora*), Thalu (*Colocasia esculenta*) etc. for preparing the medicinal gruel 'Karkkidagakanchi' and 'Noyambukanchi'. This part ritualistic/ part rejuvenating regimen is now fast dying out, but for some efforts in recent years by the advocates of traditional medicine to revive it. These wild greens are cooked in combination with the home garden species during this month.

Gender roles in collection, usage and management

Gender roles and responsibilities assigned by the society give women the predominant role in collection and processing of wild greens for consumption. As in the case of other socially assigned female roles, this requires patience and is time consuming. Women consider it as their responsibility, and this role does not vary on account of religion, ethnicity or class. For instance, Muslim, Christian and tribal women (hunter- gatherers or settled agriculturists) - all undertake this responsibility. Women perform cent percent of all labour inputs required, from collection to processing and serving. They have knowledge about each and every plant, such as its location, availability, factors influencing palatability, nutritional value and so on. For collection of the greens, women of Paniya community walk considerably long distances compared to other category of women mentioned in the present study. The Paniya women of Mutharikkunnu colony walk about 2 - 4 km everyday in search of greens, tubers and firewood. The traditional dressing style of Paniya women is attuned to storing and carrying comfortably the collected foodstuffs from field. Intrestingly, it is noticed that young girls of the community, who otherwise have taken to the dress

styles of the mainstream communities, drape the traditional dress, often over their modern clothes, when they accompany the older women for wild food collection. At times they are seen using bamboo baskets or areca palm sheath to carry the collected materials.

Compared to the other women, Paniya and Kattunaikka women are more experienced and knowledgeable regarding collection and storage. Moreover, they do not consider it demeaning or lowering their prestige to go for wild collection even in open places like waysides and fallow grounds. Whereas men, especially the Paniya and Kuruma youth and certainly the menfolk of settled communities, look upon wild green collection as beneath their dignity. Exceptions are there - when the tribal men or youth spot a rare but delicious leaf like Nakkuneetti or Koombichappu as they wander through the wild, their hands would reach out. Spotting and bringing home such rare herbs is considered an achievement. Since they travel to more distant places compared to women, their chances of spotting such herbs are more than women, who in general are confined to the domestic domain, particularly in the case of the Kuruma community. Generally though, it is considered that the man's role is to get the staple food like rice or tubers and it is the women's duty to add diversity and flavor by getting the leaves. Since many of the leaves are seasonal, they ensure year round supply to supplement their diet by zeroing in on commonly available greens specific to the season - like Thalu during Mazhakkalam(rainy season), Churuli during Manjukalam (winter) and Ponnamkkanni during Venalkalm(summer).

It was noted that some of the wild greens are exploited not only for their leaves but also for other parts like flowers in the case of Koombichappu (*Adenia hondala*), fruits in the case of Katttuthakkali (*Passiflora calcarata*) and petiole, corm and fruits in the case of Karimthalu (*Colocasia esculenta*). Women thus use the resource in a variety of beneficial ways, not restricting themselves to just the commonly used leaves. They adopt various processing methods to make the edibles consumable and palatable. For example, Kattunaikka women use different species of Kattuchena (*Amorphophallus* spp.) for the corms, but only after it is washed thoroughly several times in fresh water and then boiled in tamarind water. This takes the 'bite' - an irritating itching sensation in the throat when eaten otherwise - off. Likewise Vayalthalu's *(Colocasia esculenta),* tender petioles are harvested before the leaves unfold and then peeled, boiled in tamarind water and again kept smeared with turmeric powder/ paste for a while to remove its irritable raphides. Women patiently do such time

Kuppacheera *(Amaranthus viridis)*

Box. 1

Thalu (*Colocasia esculenta)* - an edible plant with multiple uses

This is the most widely used green by the Paniya community. The rhizome, leaves, petiole and fruit of this plant are used. Three varieties of Colocasia from three different habitats are collected and their names are associated with the habitat from where they are collected.

a. Vayalthalu/Kollithalu: Seen along the paddy field (Vayal) and associated with marshy areas, it has got a light green coloured petiole. All parts of this plant like rhizome, petiole fruit and tender leaves are used.

b. Karathalu: Seen on waysides of wet areas with large sized leaves. Its itching sting is more compared to other varieties and is treated with a liberal dose of tamarind to make it edible. Its rhizome is not commonly consumed.

c. Karinthalu: The petiole of this plant is red in colour and the plant is mainly seen in the open area. This plant is regularly used because it has more medicinal properties than other varieties. Rhizome of this plant is not used because of its itching sting.

All the above varieties are collected by women and used at least three times in a week. Sometimes women walk one to five kilometers in search of these plants. They apply coconut oil over their hands before collecting this plant to avoid the itching sensation. A knife is used to cut the petiole and rhizome and to carry the collected material, spathe of Areca palm is used. Tender leaves too are collected. The petiole is always cut 20 to 30 cm above the ground level to avoid decaying of the rhizome. A usual foray for its collection can consume between two to three hours. Women, who invariably do the washing, cleaning and processing douse their hands with tamarind and coconut oil to avoid itching. Before cooking, the outer skin of petiole and lamina are pealed off and more tamarind and turmeric powder are added to reduce the itching sensation. It is boiled first in water, which is drained off before adding the spices for the specific dish. It is a common practice to cook it in combination with crabs.

Other uses: Thalu is considered to strengthen the bones and improve the immunity of body. Young girls are fed on a diet of thalu during their menstrual periods to improve their immunity.

consuming chores to make several varieties of wild food edible and tasty. Similarly the pods of Kattupayar *(Mucuna monosperma)*, with its prickly and irritable bristles have to be peeled off and boiled in tamarind water to make it edible.

According to the usefulness of each species, the women adopt various management mechanisms for its conservation and sustainable usage. Paniya women, while collecting the leaves, irrespective of the species, harvest only the required quantity, that too from a larger number of available plants of the species. In case of Vayalthalu and Kollithalu they always pluck the leaves in a manner that a sizable portion of the petiole is left to avoid the corm of

the plant from decaying. This is despite the fact that the petiole is itself an important food supplement for them; but it is never harvested in a way that would cause damage to the underground corm. To ensure the long-term availability of some leafy greens like Karimudunga (*Solanum nigrum),* Kuruma women collect its mature fruits separately and throw them in the near by fields and home gardens, hoping for germination and long term availability. They desist from the use of inorganic fertilizers or chemicals in their agricultural field and do not disturb the fields where wild leafy vegetables grow, in order to ensure the long-term availability of the greens.

Box. 2

Caryota urens- a palm species with multiple uses

Locally known as Pana/Aanappana/Yakshippana, is a species confined to South India and Sri Lanka. The palm can be easily identified by its leaves, which resemble the tail of a fish (hence, the name 'fish tail palm'). Fruits are round and reddish. It is an under storey palm tree found in the rain forests and in Wayanad it occurs in different plantation areas and evergreen forests. Paniyas of this region use various parts of this plant as food, fuel, medicine, wood and materials for income generation (Table 8). The tender young folded leaves in the apical bud are used as greens (though not regularly, because it is not always available). The pith of this palm provides good quality sago. Normally men take the decision for its collection and both men and women are involved in the activity.

Collection and Processing: Men cut the tree to extract the pith while women help them to carry the extracted pith home. Women normally do the processing of pith in to palm powder. They crush the pith by traditional methods and soak it in water for a day bdefore separating out the powder. The powder is used for various preparations like 'haluva', 'kurukku' etc. Normally men market the product based on demand.

Fig 16: Flowchart of sequence of activities in palm powder extraction, processing and marketing and gender roles:

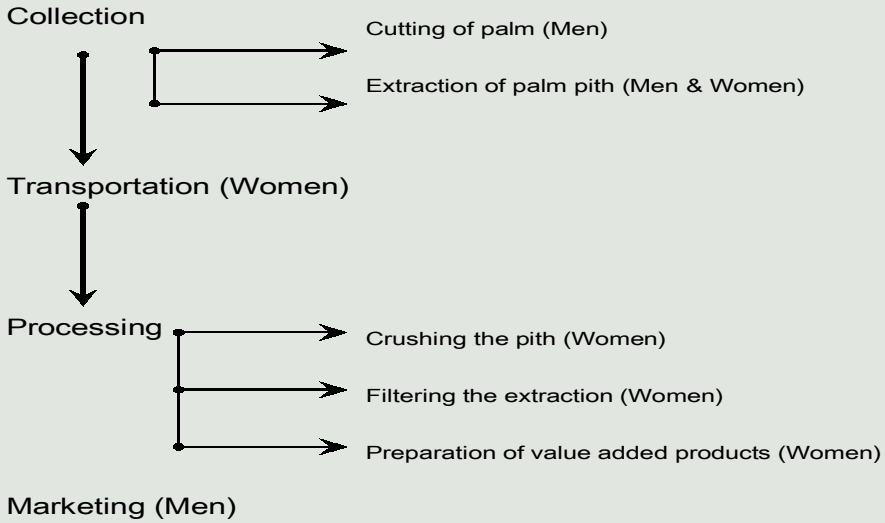


Table 7: Multiple uses of leafy greens and its gendered knowledge

Wild food	Edible part	Other uses	Who knows		
			W only	M only	Both M & W
Mudungachappu *(Solanum nigrum)*	Leaves & Fruits	Juice of leaves used for stomach problems of new born babies	✓	-	-
		To reduce the pain during menstrual periods	✓	-	-
Kattukaipa *(Momordica subangulata)*	Leaves & Fruits	Leaves used to cure stomach ache during menstrual periods	✓	-	-
Molankoompu *(Bambusa arundinacea)*	Young shoots & seeds	For rheumatic problems	-	-	✓
Kattukoova *(Maranta arundinacea)*	Tuber	Tuber used to treat urinary infection	✓	-	-
Njettippana *(Arenga wightii)*	Pith powder	Powder used to cure venereal diseases (white discharges of women)	✓	-	-
Chembila *(Colocasia esculenta)*	Leaves, petiole & fruit	Leaves used during ritual functions	-	-	✓
Karuka *(Cynodon dactylon)*	Leaves	Leaves used for ritual functions	-	-	✓
Kattuchena *(Amorphophallus sp.)*	Tuber	Used against snake bite	-	✓	-
Muyalcheviyan *(Emelia sonchifolia)*	Leaves	Used to cure throat pain	-	-	✓
Karimurikkila *(Erythrina stricta)*	Leaves	Pregnant women are given these leaves cooked in coconut oil. They believe, this helps in the the new born child being spared of skin diseases.	✓	-	-
		Use the paste externally for skin diseases	-	-	✓
Muthilila *(Centella asiatica)*	Leaves	Leaves give to children to increase memory power.	-	-	✓
		Paste of Kudangal along with turmeric use for severing the umbilical cord.	✓	-	-
		Leaves good for mouth ulcer	-	✓	-
Thakara *(Cassia tora)*	Leaves	Good for health especially during rainy season	-	-	✓
Puliyarila *(Oxalis corniculata)*	Leaves	Used to cure worms in the stomach for children	✓	-	-
Churuli *(Diplazium esculentum)*	Leaves	To cure urinary diseases of women	✓	-	-
Allanchappu *(Bidens biternata)*	Leaves	For jaundice	-	-	✓
Mullancheera *(Amaranthus spinosus)*	Leaves and stem	For rheumatism and urinary infection	✓	-	-
Vayal chully *(Hygrophylla schulli)*	Leaves	Urinary diseases & Jaundice	-	✓	-
Thazhuthama *(Boerhavia diffusa)*	Leaves	Leaves used for chest diseases	-	-	✓
Mukkappeera *(Mukia maderaspatana)*	Leaves & young fruit	Used for ulcer and urinary complaints	✓	-	-
Karimkoovalam *(Monochoria vaginalis)*	Leaves	For diabetics	-	-	✓
Kadalady *(Achyranthes aspera)*	Leaves	For making Karkkidakakkangi during rainy season (rejuvenating medicinal gruel)	✓	-	-
Ponnmkkanny *(Alternanthera sessilis)*	Leaves	For making hair oil - good for head ache	✓	-	-
Marachembu *(Remusatia vivipara)*	Tuber	For whooping cough	-	-	✓
Njotta-njodian *(Physalis minima)*	Fruit	Used for curing mouth ulcer in children	✓	-	-

Table 8: Multiple uses and benefit sharing of bio-resources- a case on 'fish tail palm'

Parts used	Uses	Who decides on use	Who makes it	If for home how used	If sold how cash used	Who decides cash use
Leaves	1. as vegetable 2. selling as elephant food	W M	W M & W	making side dish -	- *personal and home needs	- M
Pith	1. value added products 2. sell the products	M & W W	W W	making sweet dish (haluva) -	- personal & home needs	- M
Wood	1. as fuel 2. as timber 3. as ground floor of cattle shed	W M M & W	W M M & W	- - -	- personal and home needs -	- M -
Inflores-cence	1. sweet juice extract	M	M	self consumption	personal and home needs	M

M-Men, W-Women *Men use the cash for personal use like drinking alcohol, smoking, watching cinema, eating out, buying betle leaves, etc. and also for home needs like buying rice, fish etc.

Therapeutic and other uses of wild edible greens

Tribal and non-tribal men and women of the study sites use many of the wild food species, especially leafy greens, not just as edibles but for their therapeutic properties and for rituals. The related knowledge is more confined to the women of the community (Table 7). Among the 28 documented multiple uses of wild food species, uses known to women alone are 14 and to men alone are 3, while knowledge about 11 uses are common to both men and women. The medicinal uses of wild food pertaining to women related problems like white-discharge; abdominal pain during menstrual periods, post delivery related abdominal diseases, skin diseases of newly born babies, etc. are known only to women. Only women possess knowledge related to reproductive health therapy with the aid of wild food and such knowledge is transferred among female members of the family only. Many of the multiple uses known to both men and women are for common diseases like rheumatism, jaundice, breathing problems etc. Some of the greens are studied for their multiple uses in detail (Box 1 & 2).

Socio-cultural groups like Hindu, Muslim, and Kuruma in the study area use some plants like Thalu (*Colocasia esculenta*), Thakara (*Cassia tora*) as vegetables only during special occasions/periods due to its medicinal property (Paniya use these plants regularly). According to Hindu beliefs, Karkkidakam (July-August) is considered as 'Jeshta masam', which in general is considered a starvation month. People suffer from various diseases and ill health due to heavy rain and winds during this season. Women of these groups take special care to include various wild plants in their diet to increase immunity. There is less dependence on plants from their home gardens during this month since, due to heavy rain and absence of sufficient sunlight, home garden plants tend to get infested with various pests, some of which are highly toxic. During this period some special medicinal dishes like 'Karkidagakanji' are prepared using wild edible plants, many of which have got medicinal properties. Muthiyamma, an elderly woman from Puthoorvayal Kuruma colony confided:

Box. 3

Case study 1

Daily routine of Paniya women and men and wild food collection

A Paniya woman who has no regular remunerative job normally goes out for the collection of wild plants after 10'o clock in the morning (Fig.17). She wakes up around 6 a.m. and starts doing household chores like cleaning, bringing water, preparing breakfast etc. Before 10 a.m. she is through with the domestic chores and goes out in search of the greens or fish usually accompanied by other members of the colony. The collection of greens is usually combined with collection of firewood, fodder grass and washing and bathing. It is observed that in some colonies men also accompany them to collect fodder grass. Women prefer nearby fields for collection. A detailed daily routine analysis done in the household of Unni of Mutharikunnu colony revealed that the women there usually walk up to a distance of 3 km where different landscapes like vayal, kolli, and puzhayariku are still preserved in their complexity for meeting their different needs. They return to their households around 4 p.m. to have a late lunch, which usually consists of rice cooked in the morning itself.(It is common that the food cooked in the morning is eaten as lunch and dinner as well.) After a brief rest, they engage in the processing and preparation of collected food and other household tasks like storing water, cleaning, cooking etc. They usually have dinner before 8'o clock and go to bed by around 9 p.m.

Paniya women, when they are not engaged in wage labour, usually spend 5-6 hours in the field, which include 1-2 hours for greens collection. The species like Mudungachappu (*Solanum nigrum*) Thalu (*Colacassia esculenta*) requires careful and lengthy processing because of the toxic alkaloids present in such greens. They cook it initially for a while, then wash and cook again in fresh water. In Puthoorvayal Paniya colony we observed an elderly woman aged above 60 years who regularly goes for the collection of Thalu and in search of Njandu (crabs). They usually identify and firm up on four or five spots for collection and access the location in turn based on the availability of the needed food.

The daily routine of the Paniya women who go for wage work (Fig. 18) is in sharp contrast. Such women wake up around 5'o clock in the morning and complete the household chores before 7'o clock in order to go for work. They work in the field up to 4'o clock and while coming back spend some time to gather wild plants and fire-wood. Some reach back home straight from work and then venture out again for the collection to nearby places along with the youngsters of the colony. The daily routine however, varies according to the given situations, for instance in the case of Muthanga sanctuary area, the involvement of men in wild food collection is more, and sometimes men alone go for collection. This is because the dependency on forest is more compared to the wet zone sites and sending women alone is not safe in view of threats from wild animals. When the men and women do not have wage labour, they spend more time in the forest compared to the other tribal people in the wet zone.

"during Karkkidakam, plants like Thalu (*Colocasia esculenta*) and Thakara (*Cassia tora*) are imbued with medicinal properties and regular use of these plants then strengthens the bones and increases disease resistance power of the body". During Karkkidakam these plants are used almost every day. Normally Thavara tastes bitter, but the heavy rains and the attendant vigorous vegetative growth during Karkkidagam seem to reduce the bitterness. Some of the Muslim families of this area still prepare some special medicinal dishes like 'Noyambukanchi' in which they use Thalu and Thavara along with seeds of jackfruit.

Fig. 17. Daily routine of Paniya men & women not engaged in wage labour

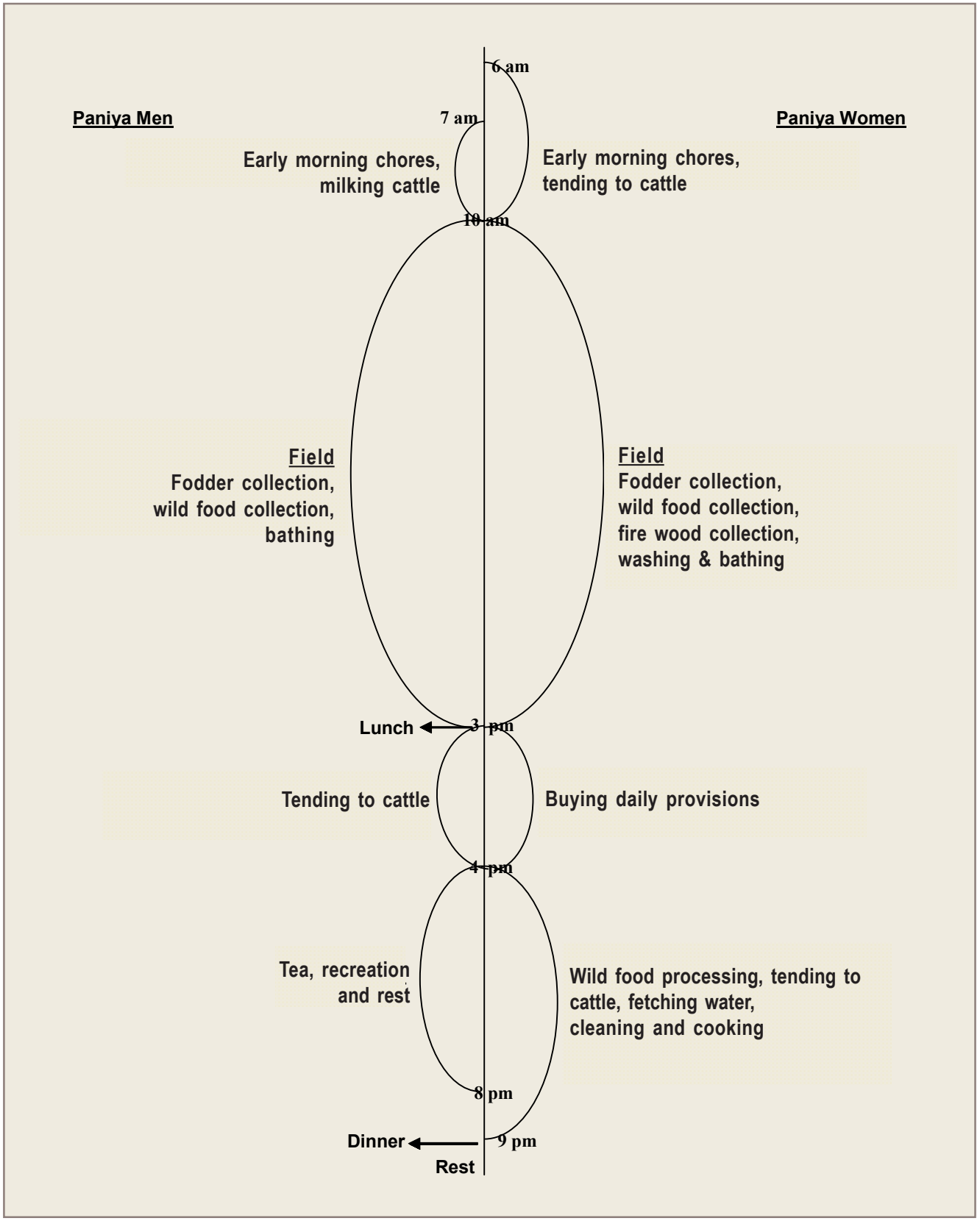
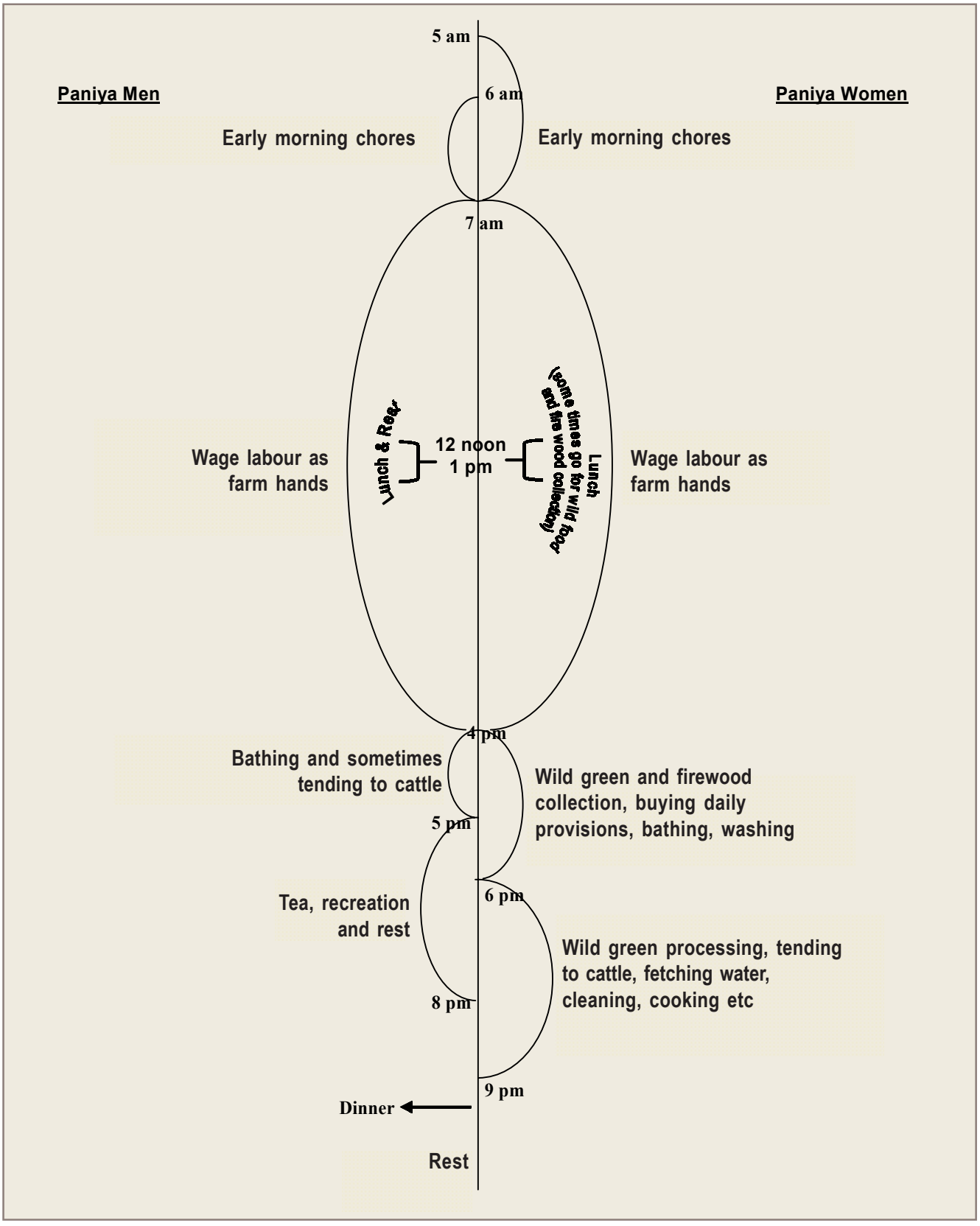


Fig. 18. Daily routine activities of Paniya men & women engaged as wage labour



Tubers

More than 25 wild plant species/types in Wayanad are known for edible roots, tubers and rhizomes and are eaten by the tribal and non-tribal communities of the district. Of these, 19 are species/varieties of Dioscorea, which is the main tuber plant known and used in this region. Wild dioscorea species are still a major source of food for forest-based communities like Kattunaikka and these serve as a 'life saving' plant group during periods of food scarcity. The communities who are dependent on wild dioscorea for their food classify each member of this genus, based on characteristics like edibility, taste, colour, size, direction of growth, fiber content, cooking properties and occasionally the proliferation underground.

Kattunaikka call these tubers as 'Kalasu' and the present study revealed that they know about 21 different Kalasu. Among the varieties known to them, Vennikalasu (*D. hamiltoni*), Hehkkukalasu (*D. belophylla*), Kavalakalasu (*D. oppositifolia*) are seen in interior evergreen and moist deciduous forests, and Erakalasu *(D.wightii)* in rocky grasslands. Noorakalasu (*D. pentaphylla*), Narakalasu (*D. wallichii*), Hendiridaekalasu (*D. bulbifera*) are found in way-side bushes and Boojikavalakalasu (*D. pubera*) in marshy areas. The Kattunaikkas collect dioscorea from almost all these places, but more frequently from the forests and other such unmanaged habitats. (Table 9). Among the different species of dioscorea, Nallanoora (*D. pentaphylla* var. *pentaphylla*) is the most commonly consumed tuber. As the name indicates, 'nalla' means safe or good to eat. The tuber is single, cylindrical, up to 1 m. in length, less fibrous, powdery when cooked and tastes good. This variety is common in the fringes of deciduous forests. Korana (*D. pentaphylla var. rheedii*) is commonly used for various culinary preparations, occasionally as stewed cake, because of its high fibre content. Unless thoroughly washed before cooking it can leave an itching sensation in the throat. Chenakorana (*D. pentaphylla var. communis*) has got the shape of a 'Chena' (elephant foot yam) and is fibrous in nature. Hendikorana (*D. pentaphylla var. linnaei*) tuber has got the shape of 'Hendi' (wild boar in the Kattunaikka dialect), with thick black coloured root hairs all over the tuber. Kavala (*D. oppositifolia*) is another very popular tuber among all the tribes of Wayanad. It is excellent in taste and is commonly found in moist forests on which the Kattunaikka community depend more. Salukalasu, which is identified as *D. tomentosa*, is not consumed regularly due to its high mucilaginous content, and is eaten only during times of acute famine. It has peculiar kind of fibres, that leave an itching sensation when consumed, particularly on children, making communities other than the Kattunaikka shy away from this tuber.

Hindhikorana *(Dioscorea pentaphylla var. linnaei)*

The Paniya community, the study recorded, use roots and tubers of 19 plant species as their food. As in the case of Kattunaikka, dioscorea (Kattukachil or

Table 9. Dioscorea species consumed by Kattunaikka

Scientific name	Local name (Kattunaikka)	Available landscapes	Method of cooking
Dioscorea pentaphylla var. pentaphylla	Noora	Moist deciduous forest	Gravy
Dioscorea pentaphylla var. rheedii	Korana	Moist deciduous forest	Gravy, Steaming
D.pentaphylla var.communis	Chenakorana	Moist deciduous forest	Steaming
D.pentaphylla var. *linnaei*	Hendhikorana	Moist deciduous forest	Roasting
Dioscorea hispida	Kottunoora	Moist deciduous forest	Gravy
Dioscorea sp.	Moodavenni	Moist deciduous forest	Gravy
Dioscorea hamiltoni	Kaluvenni	Evergreen and moist deciduous forest	Gravy
Dioscorea belophylla	Hekku	Moist deciduous forest	Gravy
Dioscorea sp.	Hekkuheruman	Moist deciduous forest	Gravy
Dioscorea sp.	Heruman	Moist deciduous forest	Gravy
Dioscorea wallichii	Narra	Wayside bushes	Roasting
Dioscorea sp.	Narramooyan	Wayside bushes	Gravy, steaming
Dioscorea oppositifolia	Kavalakalasu	Evergreen and moist deciduous forest	Gravy
Dioscorea wightii?	Erekalasu	Rocky grass lands	Gravy, steaming
Dioscorea intermedia	Shoddikalasu	Dry deciduous forest	Gravy, steaming
Dioscorea pubera	Boojikavala	Marshy areas	Gravy
Dioscorea pentaphylla	Noora korana	Wayside bushes	Steaming
Dioscorea tomentosa	Salu	Moist deciduous forest	Roasting
Dioscorea kalkapershadii	Nara	Plantations & waysides	Roasting

Kattukizhangu) form an important source of their food. They consume 9 kinds of dioscorea tubers, in which the most preferred ones are Kavalakizhangu (*D. oppositifolia*) and Noorakizhangu (*D. pentaphylla* var. *pentaphylla*). They consider the Noorakizhangu and Kavalkizhangu to be rich in 'Podi' (starch) and 'Kozhuppu' (fat) and the Narakizhangu (*D. wallichii*) to be rich in 'Naru' (fibre). Noora and Kavala do not need any detoxification before cooking.

Kuruma, Wayanadan Chetty and other settler communities know only three species of dioscorea. Fifteen to twenty years ago, men of these communities used to collect Kavala and Noora, but today wild tubers do not flavor their diets. They consider it too tedious a job to search and dig out the tuber, being otherwise engaged. They grow several tubers in their home gardens and these are none too costly in the markets either. All the different socio-cultural groups have got *Dioscorea alata* as a cultivated species in their home garden. An interesting aside is that in Chooralmala area of the district, Muslim, Hindu and Christian women buy Kavala and Noorakizhangu from the Paniyas in exchange for money or rice. Many of the youngsters of these communities are but totally ignorant about

Dioscorea collection

these tubers or their importance mainly because wild dioscorea are no more a part of their diet.

Gender roles in germplasm management and utilisation

Among the various tubers, *D. hamiltonii*, *D. oppositifolia* and *D. pentaphylla* var *pentaphylla* are the varieties most frequently consumed. Men and women of Kattunaikka community are well versed in the identification of dioscorea in terms of its availability, habitat and associated plants. They are also adept at identifying the matured and sweet tuber ideal for consumption. Commonly, men and women go together for collection (Table 10). The tubers that are deeply rooted, for example *D. hamiltoni*, are usually dug out by men. Occasionally whole families go in search of tubers, which could take up the whole day and collect enough quantities. There are instances when this can stretch up to a week. The collected tuber is stored in the open, inside the huts. A wide range of methods is adopted for processing the tubers. The tuber of Kottunoora (*D. hispida*) requires thorough processing before consumption. The chopped tubers are wrapped in a white cloth and kept in running water in the streams for over 24 hours before being cooked. No other community in the study area consume this variety as it is considered toxic.

Kattunaikka women in many of the sites surveyed have attempted to introduce several of the species of dioscorea, into their home gardens. Nallanoora and Noorakorana are preferred for cultivation, as they are tastier and more nutritious than other varieties. Some families of Ponkuzhy Kattunaikka colony have introduced the highly delicious Boojikavala (*D. pubera*) in their backyards. This is a a rare species, occurring in interior forests and is difficult to source easily. The difficulty in harvesting and the requirement of full length tubers for replanting and cultivation however, keeps the *D. belophylla*. species away from the home garden. The selection of species for introduction chiefly depends on the availability of the variety and its cooking quality. Women prefer those varieties that are good for making side dishes to the staple rice. The varieties good for steaming and roasting (depending on the fibrous nature of tubers) are also given importance in the collection. It is observed that the species found in close proximity to their habitations are not so sought after to be introduced in to the home garden, even if they are rare.

For the Paniya community, especially of the wet zone, tuber collection is a highly seasonal activity because of the distance from the forest, and is undertaken only two or three times in a year. Before venturing out for collection both the men and women discuss and plan the locations, the timing, tools and materials to be taken, etc. They always go for collection during summer months, as the size of the tuber is very small during rainy season. They usually walk 10 to 15 km. for dioscorea harvest. People of Mutharikkunnu depend on Sugandhagiri, Vythiri and Amba forests for tuber collection, ie, 15 km away from their hamlet. The inhabitants of Puthoorvayal Paniya colony

Table: 10. Gender roles in dioscorea collection, processing and management

Attributes	Kattunaikka		Paniya		Kuruma	
	M	W	M	W	M	W
Planning & decision taking	✓	✓	✓	✓	✓	-
Making tools	✓	-	✓	-	✓	-
Locating the tuber	✓	✓	-	✓	✓	-
Digging tuber	✓	✓	✓	-	✓	-
Removing soil	✓	✓	-	✓	✓	-
Putting one piece for regeneration	✓	✓	✓	✓	-	-
Processing & cooking	✓	✓	-	✓	-	✓

M-men, W-women

access Manikkunnumala for the collection, undertaking a long trek. Women avoid going alone to the interior forests for fear of wild elephants. The digging out of the tubers is a collective effort involving both men and women. A sharpened stem of bamboo or palm called 'Vathikka' is used to dig out the tuber. Men are experts in making this tool from the forest itself. While men dig out the tubers spotted, women go around to locate fresh dioscorea plants (Kizhanguvalli) and spot the exact location of the tuber underground. Vellakka, a middle aged woman of Mutharikkunnu colony, said that good quality tubers are available only in summer, but many hesitate to go in search of it in summer because it is difficult to locate the plants, as the vines and leaves would have dried up. "Locating the position from where the stem starts and the position of the tuber is a difficult task which needs a lot of patience" she avers. Digging out the tuber is a collective effort and while men are digging out the tubers, women help them by removing the soil, stones etc. from the pit. Women also dig out the tubers, but only those that are shallowly rooted. It is easy for them to go for plants that are grown near rocky crevices because the tubers never go deep there and the entire tuber could be dug out by just removing one or two pieces of rock. It was observed that Paniya men and women above fourty years of age have a clear idea about the tuber's growing pattern. However men are better informed in identifying different roots and tubers based on the shape and texture of their leaves and wines.

After the tuber is dug out, the apical portion of it, along with the stem (vine) is put back in the pit and filled with soil up to three fourth level for its regeneration. Another piece is placed in a small pit close by to confuse the wild boars who are in constant competition with the tribals for wild tubers. Almost all the roots and tubers require processing to make them edible and palatable. In the case of the Paniyas of the wet zone, women always do the processing and cooking of dioscorea, though in some cases, Kattunaikka and Paniya men of dry zone are also seen to help in processing.

Nannari (*Hemidesmus indicus*), Muthanga (*Cyperus rotundus*), Sathavari (*Asperagus racemosus*), Unnithandu (*Costus speciosus*), various species of wild curcuma and wild ginger are some of the other wild plants used for roots, rhizomes and tubers by various socio-cultural groups of the study area and are often used as important ingredients in certain traditional medicines.

In the collection, processing and management of dioscorea we can clearly see differences in gender roles in each socio-cultural group. In the case of Kattunaikka the entire task is shared by both men and women except for tool making for dioscorea collection. In the case of Paniya there is a clear division of tasks except for the responsibility of ensuring the long-term availability of tuber. Both men and women make it a point to retain a piece of tuber in the pit for regeneration. In the case of Kuruma there is no involvement of women in the collection and management of dioscorea and men play a predominant role in the identification and collection of other tubers. Though women are also involved in collection to support men, processing is left completely to women and they hold the related knowledge.

Fruits and seeds

Fruits and seeds are an important group of edibles, which contribute to the tribal communities' nutritional requirements. Much of their vitamin and mineral needs are met by this category of food. Information on 62 such fruits and seeds (fruits 55, seeds 7) was collected during the study (Annex. 1). Among the fruit yielding plants, 33 are trees, usually found in the forests and hills. Fruit trees like Plavu (*Artocarpus heterophyllus*), Mavu (*Mangifera indica*), Athi *(Ficus racemosa*) and Njaval (*Syzygium cumini*) are protected on waysides and in the agricultural landscapes in the study sites. The fruits of these trees (except ficus) are widely used by people across communities on a regular basis. Various ficus varieties are protected, either for their sanctity or because the birds feed on them or because they host nocturnal animals like bats which are beneficial to the crops. Among the tribal

Kattumunthiri *(Rubus fulvus)*

communities, the Paniyas are the largest consumers of various wild fruits. There are about 50 species that are consumed by this community alone, largely collected from forests, wooded hills or such unmanaged areas. The non-tribal communities restrict themselves to the fruits of jack, mango, gooseberry and njaval trees and generally avoid the lesser-known fruits from the forests.

Gender roles in collection, processing and management

It is observed that while men and children seek after fruits and seeds based on thier individual preferences, women consider the requirements of the family as a whole. For instance, the species which are preferred by women are Chakka (Artocarpus heterophyllus), Eenthukaya (*Cycas circinalis*), Putharichunda (*Solanum anguivi*), Nellikka (*Emblica officinalis*) and Ayanichakka (*Artocarpus hirsutus*). These are collected not for their own individual consumption while they wander in the wild, but rather for all the family members. Women go out specifically to collect such fruits accompanied by children or some times men (Table 11). When women go alone they use long poles to harvest fruits like jack and gooseberry.

It is not an unusual practice for them to leave the upper branches of fruit trees unharvested or selectively harvested for the birds and other animals to savour. The Kattunaikka women of Ponkuzhy colony were seen adhering to this norm unfailingly. Unripe jack fruits as well as seeds (Chakkakkuru) are cooked as side dishes to go with rice. There are a number of culinary items like 'Chakkapuzhukku', 'Chakkathoran', 'Chakkapayasam' 'Chakkakkuruthoran', 'Chakka chips', etc, prepared out of the fruit kernel and seeds. In most of the settlements, the jackfruit trees were seen to be well managed and protected largely by women. Trees like Plavu and Ayani are used for requirements of timber especially by the non-tribal communities. Among the socially advanced or economically well off families, it is not uncommon to see such trees being cut down and sold as timber. While the men would turn to cutting down the trees for consumption expenses or to pay off debts, the

Table: 11. Gender based division of labour in collection and processing of some of the wild fruits/seeds:

Wild fruits/seeds	Scientific name	Collection		Processing	
		M	F	M	F
Ayanichakka	*Artocarpus hirsutus*	✓	✓	-	✓
Kattuchakka	*Artocarpus heterophyllus*	✓	✓	-	✓
Eenthu	*Cycas circinalis*	-	✓	-	✓
Putharichunda	*Solanum torvum*	✓	✓	-	✓
Mulayari	*Bambusa arundinacea*	-	✓	-	✓
Wild mango	*Mangifera indica*	✓	✓	-	✓
Nellikka	*Emblica officinalis*	✓	✓	-	✓
Kattukudampuli	*Garcinia gummigutta*	✓	✓	✓	✓

women favor the sale of such trees only to meet expenditures related to buying land, building a house, marriage of their daughters, etc. Elemma, a Christian woman was lamenting that her husband sold many such fruit trees to recover the losses from the cultivation of cash crops like ginger and pepper. Since there is no individual ownership of trees in the case of tribal communities, many of these species get conserved in and around their habitations, especially those of the Kuruma communities. Among the settlers, it was a practice to plant jack trees as support for pepper vines, taking into the consideration its multiple uses. But now fast growing exotic trees like silver oak (*Grewelia sylvestris*) have replaced the jack trees as support tree for pepper vines. Men prefer silver oak because of its quick, straight growth and because its rough bark surface suits pepper vines. Women, however, continue to prefer jack, though it is a slow growing tree, as it cater to the food requirements of the family. A woman of Puthoorvayal Paniya colony told us that at times of food scarcity, jack fruits are their sole recourse. We saw in many households, irrespective of class or creed, women showing keen interest in storing jackfruit seeds for the future months. Since it is a seasonal fruit, much attention is given to collecting and storing the maximum seeds possible during the season. Invariably, the seeds are stored in clay pots after smearing them with dry soil. Another important fruit tree managed mainly by the non-tribal women is Eenthu. This is a rare plant observed in the study area, which is mainly conserved for edible seeds and ornamental leaves. A number of dishes are prepared out of this fruit after thorough processing. During the fruiting season women take special interest in collecting the seeds and store them dried for future use. The women consider the flour made out of this particular fruit to be of high nutritional and medicinal value.

Oodal *(Sarcostigma kleini)*

Nellikka (*Emblica officinalis*) is one of the most widely collected non-wood forest produce and it is an important source of income for Kattunaikka families. Both women and men are engaged in the collection and sale of Nellikka. A tribal co-operative society in the Muthanga Sanctuary area buy the Nellikka from the tribals and market it. While many non-tribal communities would have no qualms about cutting down the entire fruit laden branch of the gooseberry tree for ease of collection, the Kattunaikka men still painstakingly pluck the Nellikka leaving the tree and branches intact. The unsustainable way of harvesting gooseberry, resorted to by other communities has to do with the increasing competition between the communities for products that have gained commercial value in the market. For the children of Kattunaikka and Paniya communities, many of the wild fruits are like what toffees are for urban children. Women and men of Kattunaikka and Paniya communities make it a point to bring home berries and fruits when they return from their sojourns, for whatever purpose, in the forests. The children themselves are greatly adept at identifying various edible fruits.

Kuruma women are rather selective in their choice of fruits. They accord greater preference to mango and jack. Raw mangoes are widely collected to

prepare dishes like 'Mangapuli', which is used as souring agent for their dishes. This can be stored for years together without any preservatives and no deterioration in quality. Women have specific knowledge about such preparations and storage techniques. This product is now being marketed in Muthanga, by a Self-Help Group that is engaged in initiating micro enterprises among women.

Another important wild fruit collected for the market is Kudampuli (*Garcinia gummigutta*). Women, children and youth can be seen engaged in door to door marketing of this fruit, in towns and dwellings of plantation labour. Men, women and children of the Paniya community of Attamala forest are actively engaged in Kudampuli collection and processing. During the fruiting season men and women stay put in the interior forest itself, to do the collection, processing and drying of Kudampuli, which is in excellent demand.

An important seed, which largely the Paniya and occasionally the Kattunaikka use, is that of bamboo (Mulayari). During the flowering season of bamboo, this is an all too important ingredient in their diet. Bamboo flowers very rarely and at the onset of the flowering season the Paniya women start preparations for the collection of seeds. Forest bamboo thrive in large populations covering wide forest expanses as can be seen in the Muthanga Wildlife Sanctuary area. Women go to the bamboo brakes before fruit setting and clear the undergrowth and prepare a clean bed for the seeds to fall. Sometimes, the ground around big canopies of bamboo are even smeared with cow dung, an indication of the value the tribals attach to this rare bonanza from the forests. The collection may continue for days together and men and children join in gathering the seeds. It is often seen that the entire family stays put amidst the bamboo brakes through the flowering period. The collected grains are carefully stored for future use, accentuated by the popular belief that a period of famine follow the flowering of bamboo. Bamboo seeds are put to a variety of uses, the most common being as gruel or to make the popular steamed pancake 'puttu' for the preparation of which the grains have to be coarsely ground. Considered highly nutritious and relished by every one in the family, bamboo seeds are also sought after by the non-tribal communities. Paniya elders of Muthanga recall that no too long ago, people from as far off as Mysore, on hearing about the bamboo flowering, used to make a beeline to them to buy the seeds.

Mushrooms

About 2500 species of mushrooms are reported from across the world but only a few of the wild mushrooms are eaten by the rural population. Besides their diverse and interesting culinary uses, mushrooms are much endowed with nutritional and medicinal value. Some mushrooms are reported to contain cancer-fighting properties and several aid the body's immune system. Many of these are good sources of protein, vitamins, and minerals. The carbohydrate content in mushrooms is very low, therefore these are specially recommended to diabetic and anaemic persons, owing to their high folic acid content.

Nettanavae

The present study has revealed that around 35 different wild mushrooms are consumed by the people of the study area. The availability is seasonal and specific to their habitats and host plants. This delicacy is usually available after the onset of the monsoons – both Edvappathy (south-west monsoon) and Thulavarsham (north-east monsoon). The common habitats where mushrooms are found are: open areas in plantations, forest edges, alongside forest paths, inside bamboo brakes, fallow fields, on termite mounts and riversides. Mushrooms are also seen on tree trunks and decayed woods in the forested areas and plantations. The most commonly consumed mushrooms are Arikkoon, Puttukoon and Perumkali, which are highly delicious and available in plenty, though they are very specific to peculiar habitats. For instance, Arikkoon and Puttukoon are seen only around termite mounts. Perumkali variety is seen in moist and exposed open areas where the remnants of old termite mounts can be traced. The details of conservation, utilisation and management of mushrooms have been investigated community wise, showing that the use pattern, knowledge and management varies from community to community.

Mushroom processing

The Kattunaikkas consume a greater variety of mushrooms, as many such species are conveniently available in the forests which Kattunaikka men and women frequently access. Around 33 species of mushrooms, called 'Anavae' in their dialect, supplement their nutritional requirements, which are classified into three groups, based on the habitat where they sprout. These are Maranavae -mushrooms seen on the bark of different trees, Huthaanavae- those seen on termite mounts and Mannanavae - which are on the forest floor and associated habitats. The Maranavae found only on certain host species are consumed by the community; preference being to trees belonging to *S*yzygium, Dalbergia, Mangifera, Lagerstroemia, Erythrina, Persea and Bamboo. These mushrooms are named after the host trees; for example, the Anavae seen in Njeral (*Syzigium cumini*) is called Njeralanavae, on Jal (*Dalbergia latifolia*) Jalanavae, on Kaval (*Erythrina indica*) Kavalanavae and so on.

There are three species of Huthanavae. The one which is milky white in colour, is called Vellanavae, pale white in colour is Ummanavae and the large sized off-white coloured is typical Huthanavae. The community considers the mushrooms seen associated with 'Huthu'(termite mount) to be non-toxic and do not feel the need to process it in any manner. Children of this community would even eat such mushrooms raw, without any fear. The Ummanavae and Vellanavae usually sprout in dense groups, while Huthanavae grow either singly or in sparse groups. The Mannanavae, which sprout on soil, are also classified into three groups based on the growth habit, i.e, mushrooms which sprout in groups or singly.

Around 15 different kinds of this type of mushroom are consumed by this community.

'Kumman' is the Paniya word for mushrooms, which is considered a delicacy. This community uses about 25 species of Kumman, many of which are collected from plantations. Mushrooms are classified into two groups by them: Marakkumman (those seen on trees) and Mannukkumman (those seen in soil). These are further classified based on substrate, shape, size etc. For example Valakkumma' refers to mushrooms that sprout in Valam (cowdung-compost), Vaikkolkkumma' (sprouts on Vaikkol-paddy straw), Kathukkumman (the one that has the shape of 'Kathu'-human earlobes) Ambukkumman (that has the shape of 'Ambu'-arrow).The Kathukkumman which is seen in plenty commonly on Murikku (*Erythrina indica*) during rainy season is consumed only by this community.

The Kurumas refer to mushrooms as 'Koonu', the same popular malayalam word for it, and it finds pride of place in the family menu when available. Around 14 species are consumed by Kuruma, who, by and large, only prefer the 'Koonu' seen on soil, especially, those associated with termite mounts. The most commonly consumed mushrooms are Perumkoonu, Arikoonu, Nedumthali and Puttukoonu. In contrast to other communities, Kuruma women preserve and store the mushrooms for future use after properly drying it. The dried mushrooms can be stored till the next season without losing any of its qualities.

Compared to the tribal communities, the non-tribal communities use only very few mushrooms, largely the Arikoon and Puttukoon, which are considered highly delicious. Among the non-tribal communities, Muslims refer to different varieties of mushrooms by distinct names like Mothirakkanikoon, Pavakoon etc.

Gender roles in collection, processing and management

Mostly women and girls are involved in the collection, processing, preservation and preparation of mushrooms (Table 12). It is observed that mushrooms are now gathered for edible purposes, principally for their culinary value, though in the past they were used for various spiritual and ritual needs. Some of the mushrooms, which have hallucinating effect were used mainly by men during various ritual performances. Mushrooms, which when cooked tastes akin to meat dishes are preferred by all, though, while serving, it is the men and children that get preference! Women, by and large, hold the knowledge about its quality, use and conservation. It is impossible to deliberately introduce mushrooms in to the home gardens, but women take interest in protecting the wild habitats and areas in the home gardens where they naturally sprout. It was noticed that across the entire tribal and non-tribal communities women protect the termite mounts and the tree species which host certain mushrooms.

Though the collection and processing are in the women's domain, men help in some specific activities like collecting mushrooms that are seen on tall tree trunks or in the interior forests. In the Ponkuzhy

Table: 12. Gender roles in the collection and processing of wild mushrooms by different socio-cultural groups

Socio-cultural groups	Collection				Processing				Decision taken			
	Men		Women		Men		Women		Men		Women	
	Ad	Ch	Ad	Ch	Ad	Ch	Ad	Ch	Ad	Ch	Ad	Ch
Paniya	✓	-	✓	✓	-	-	✓	✓	✓	-	✓	-
Kattunaikka	✓	✓	✓	✓	-	-	✓	✓	✓	-	✓	-
Kuruma	-	-	✓	✓	-	-	✓	-	-	-	✓	-
Chetty	-	-	✓	-	-	-	✓	-	-	-	✓	-
Hindu	-	-	✓	-	-	-	✓	-	-	-	✓	-
Muslim	-	-	✓	-	-	-	✓	-	-	-	✓	-
Christian	-	-	✓	-	-	-	✓	-	-	-	✓	-

Ad - Adult Ch - Children


Arikoon

Kattunaikka settlements we observed men helping women to collect mushrooms settled high on the tree trunks. The women use different criteria, like culinary qualities, palatability, and nutrition while selecting and conserving mushrooms. Certain mushrooms are made edible through de-toxification, commonly by smearing the mushrooms with turmeric powder after cutting them into small pieces after removing all the dark coloured portions. Kattunaikka women, among the others, are more adept at distinguishing between poisonous and non-poisonous varieties, usually by odour and colour. Even from a distance they can smell out toxic and non-toxic mushrooms and identify the location. Rukmini of Ponkuzhi Kattunaikka settlement avers that the ability is no different from locating a ripe jackfruit from a distance by the smell. While collecting mushrooms from tree trunks, maximum care is given to harvest only the fruiting body and spare the the basal portion to sprout again. Children of the Kattunaikka community are very enthusiastic to set out for mushroom collection, since some varieties are palatable even when eaten raw. But within the Kattunaikka group variation in gender division of labour corresponding to the income status of the families are noticed. In Aranamala Kattunaikka colony, which is relatively better off since they grow cash crops like coffee and cardamom, children and men show little interest in collecting mushrooms or any other wild food. While the collection and management of mushrooms is a joint activity of Kattunaikka women and men of Ponkuzhy settlement, in Aranamala, it is only the women who are involved. The inhabitants of the latter colony are now more settled cultivators (producers) than gatherers. But the household food and nutritional security, which is still dependent to a great extent on the gathering function is considered the women's responsibility.

Among the Paniya community, men sometimes help women in collection. But women of the community consider it their responsibility to collect, process and cook such delicacies. Normally men bother to collect only those mushrooms which are either very tasty or rare in distribution, which they come across while out on other errands. Men also avoid those mushrooms which require patient tedious labour to collect as in the case of the tiny Arikkoon. Like the Kattunaikka, Paniya women are also experts in identifying edible and non-edible mushrooms based on colour and odour. In the past, they used to collect all the edible mushrooms, but now only those that are very palatable and which the men of the household have taken a liking to are regularly collected. This is a factor that is likely to weigh on the conservation and management of such resources. Since the men of the households do not any more fancy some types of wild foods, eventually, their management and protection is ignored. This is in stark evidence in the case of mushroom management in Arananmala Kattunaikka and Puthoorvayal Paniya settlements.

The Paniya women in general distinctly remember the time of the year and the specific locality where mushrooms are available. It is believed that some

varieties of mushrooms recurringly sprout exactly at the same time of the year and at the exact location. We saw these details written on the wall of one Smt. Vallaka in Mutharrikkunu Paniya colony, who on the appointed day is early at the spot, to lay hands first on the delicacy. The same enthusiasm though, is missing in the children of this community, especially the school going ones.

Among the Kuruma community, collecting mushrooms is considered exclusively the woman's job. They collect mushrooms like Arikkoon and Puttukoon considered to be the more safe varieties, which also require hardly any processing. Despite the growing trend in this community, of women being increasingly confined to their households and men assuming the role of sole bread winners, the Kuruma women retain enough knowledge about the nature and kind of mushrooms which can be stored or eaten instantly. The mushrooms which can be processed and stored, in general, have less mucilaginous substances and soft fiber coatings. They are kept in turmeric water for a day, bundled and smoke dried above the hearth.

Among non- tribal communities, men are not in the picture at any stage of mushroom collection, processing or food preparation. Even girl children are not involved in the collection as most of them are school going and have little time to meander in the open or even in the homesteads. It was evident from the study that the burden on women of poor families has increased. In economically poor Muslim families, women have to struggle to gather or harvest food for their family. They compete with Paniya and Kuruma women for the collection of Puttukkoon and Arikkoon. These two mushroom varieties sprout immediately after the first rains on the termite mounts in the plantations. Earlier the Paniya women were the first at the site at the break of dawn and only their clamour would draw the attention of others to the fresh sprouts. Now as 'Patta'- an elderly woman of Chooralmala Paniya settlement feels, not only are mushrooms rare, there is also competition from poor women of other communities who get to the spot even before her. While the resource poor Muslim women are drawn to it out of necessity, even the economically better-off Hindu and Christian women would not shy away if it is a fresh sprout of Puttukkoon, considered a rare delicacy.

The Paniya women, the study reveals, have to walk long distances these days for mushrooms as they are seen only in less polluted habitats, which are often far off from their habitation.Vellaka of Mutharikkunu colony says she is used to walking long distances, some times more than 5 kms, to collect mushrooms. Kattunaikka tribes, being mostly confined to the forest, tend to get mushrooms in their vicinity. The Kuruma women search for mushrooms only in their surroundings, mostly in the hill slopes or in coffee or teak plantations. Except for the resource poor Muslim, women of non-tribal communities avoid going even to plantations and gather only the mushrooms available in their immediate vicinity, if not just their homestead.

None of the communities in the study area collect mushrooms for sale or marketing but only for domestic consumption. But for a little support extended in collection by the men of Paniya and Kattunaikka communities, the entire responsibility of mushroom harvesting, processing and dish preparation is shouldered by women. The accelerated degradation of the ecological system and the growing dislocation of communities from their original habitats has not only affected mushroom availability but also brought in competition among the women of different communities for accessing this wild delicacy.

Honey

Honey is one of the most important minor forest produce for most Dravidian tribal communities. It features as a major constituent of their diet as well. The tribal communities classify different types of honey according to the type of bees and the nature of hives from which they are collected and they vary

greatly in taste and therapeutic properties. All the varieties of honey have great demand in the market. Tribal communities are among the most skilled in locating, extracting, processing and preserving honey and among the most knowledgeable about the dietary and cuarative properties of honey. Much of the mainstream traditional knowledge about honey owes its origins to the tribals and they continue to add to the rich repository of 'honey lore' in this country.

Kattunaikka are also known as Jenukkurumba because of their exceptionally high skill in 'Jen' (the Kattunaikka word for honey) collection. They recognize five types of 'Jen': Kombujen/DaddanJen, Thudajen, Gandajen/Dojjan, Nasarjen/Kothukujen, and Kusumbujen/Cherujen. The bulk of the honey comes from hives seen in the branches of tall trees or rock crevices (Kombujen-more than 25kg/hive). The bees that produce this honey are larger in size and yellowish in colour (Vijayan, Ponkuzhy, Kattunaikka colony). Honey is also differentiated based on the season of availability, as Kannijen which is available in bulk during Kannimasam (Sept.-Oct.) and Karthijen which is available in Karkkidakam (July). The availability and quality of honey is based on the flowering of forest trees in the locality. Flowering of Venthekku (*Lagerstromea lanceolata*) signals abundant availability of Kombujen, whereas, as Rugmini and Vijayan of Ponkuzy colony told us, some forest trees that bloom during the rainy months could make the Kombujen toxic and might cause vomiting if consumed.

The hives of Thudaijen/Pothujen are mainly seen in tree crevices or in inactive white ants' pits. The color of the honey is reddish brown and its availability is usually based on the flowering of Mattimaram (*Terminalia tomentosa*). The Jenukkurumbas are experts in inducing the small bees of the melipona species to hive in bamboo stems, to get an almost 'captive supply' of the delicious Cherujen. Cherujen is the most precious of the various varieties of honey, sparsely produced, difficult to extract and believed to possess excellent nutritional and medicinal attributes. It is available round the year. Raghavan of Aranamala Kattunaikka colony informed us that the taste of the honey stored in the different chambers of a single hive of this bee tend to be different as the bees fill the honey sourced from different flowers separately in various chambers. The Kattunaikkas are expert honey tasters and will link the distinct tastes to specific forest flowers. Kedujen/Kothukujen is mainly seen on dry branches of bushy plants and the bees are comparatively smaller.

The nutritional value of honey is widely known to the men and women of all the communities studied. The Kattunaikka and hill Paniya communities possess a wealth of knowledge about the nutritional and therapeutic value of honey. In the past, these two communities habitually consumed a great deal of honey and it was undoubtedly an important contributory factor to their health and food security. Many of the Kattunaikka men and women told us about how regular consumption of honey, tubers and wild meat ensured their health and well-being. Today, honey has been catapulted to the position of one of the most important non-wood forest produce reaching the market. There is, undoubtedly, fairly good demand for forest honey in the market. Several traditional ayurvedic physicians insist that only pure forest honey be used in their medicinal preparations. There are organic stores in the state that sell only wild honey, as it is reckoned to be much better in quality to the honey sourced from apiaries set amidst the pesticide sprayed plantations. But the lure of little lucre forces the communities to sell the entire honey harvested in the market. Their own honey consumption has therefore been drastically reduced, with telling effect on their health and nutritional security. It is also a fact that the quantity of honey has reduced considerably owing to the change in the flowering pattern of the trees, brought about by the change in climate and the high pesticidal application in coffee and cardamom plantations. Raghavan of Aranamala Kattunaikka colony cites the timing of pesticide application in the plantations - in the morning, when the bees too are at the flowers - to be the main cause of

dwindling bee numbers. It is a fatal coincidence, the direct exposure to the hazardous chemicals wipes out populations of honey bees.

Gender roles in collection and management

Honey is collected from the hives on tree branches, hollow tree trunks, rock crevices and in the anthills. The Kattunaikkas have developed over time a host of techniques for honey collection. A honey expedition in to the forest requires much preparation and pro-active thinking. If the honey is located far away from the dwellings, a whole group of men and women join the foray and stay put in the forests through the period of collection, which might stretch to up to two weeks. Both men and women are good at locating the hives and easily pick up the sound of different bees in flight. These bees are watched and followed to the hives. Sometimes both men and women together set out to the forests, about a month before the season, to locate the bee hives. The trees on which bee hives are spotted would then be marked with an axe, to indicate that honey collection from these are reserved. As a norm, other tribal groups would avoid these trees, if chanced upon. The flowering of certain varieties of trees in a particular part of the forest is also an indication of the presence of bee hives. April-May and August- September are the harvest seasons. Usually a group of three to five members is involved in honey collection. While in the specific act of extraction, especially when the bee hives are located on tall trees, women may not be involved, they are crucial in providing the logistics. These include organising much of the wherewithall for the collection trip including procuring the necessary tools, organising the required provisions for the period of extended stay in the woods, cooking the food for the whole group during the days, in other words, most of the tedious work (Table 13).

Smoking is a usual technique practised to drive away bees from the hive. The most experienced man among the group climbes the tree, securing himself with a basket, knife, axe, string and smoking materials. If the tree is too tall, a bamboo ladder is at times used to scale part of the height, but mostly the agile Kattunaikkas need just their bare legs and arms, sans any aid to scale even dizzying heights. The bees are driven away by driving smoke in to the hives using fresh green grass, which is again collected by women. The honey collected is shared equally, but for an extra portion going to the person who does the actual job of extraction from the hive, scaling great heights. Normally Kombuthen from rock crevices and tall trees is collected at night when the bees are inactive. Collecting Pothujen/thudajen from tree crevices and termite mounts is considered comparatively easy and womens participation in it

Table: 13. Gender roles in honey collection, processing and marketing

Sl. No	Activities	Men	Women	Children
1.	Preparation for collection trip			
	a. make ready the materials for food preparation	-	✓	-
	b. make ready the materials for collection	✓	✓	-
2.	Locating the hives	✓	✓	-
3.	Collection of grass for smoking	-	✓	-
4.	Collection of leaves for squeezing honey	-	✓	-
5.	Collection of honey from tree branches (Kombuthen)	✓	-	-
6.	Collection of honey from rock and tree crevices (Pothuthen)	✓	✓	-
7.	Preparation of food	-	✓	-
8.	Processing	✓	✓	✓
9.	Marketing	✓	✓	-
10.	Money handling	✓	-	-

is greater. When they observe a line of bees continuously entering and leaving the hives, smoke is brought in to drive the bees away. Some even blow in to the hives to drive away the bees - 'but we must close our eyes and protect ourselves', cautions Rugmuni of Ponkuzhy Kattunaikka colony. According to her, these bees, unlike most other varieties are less troublesome. Before collecting honey, a small portion of the beehive would be cut open to observe the maturity of bees and honey. If young bees are in the hive, a portion of honey will always be left behind - 'they would die of starvation if not', Rugmini offers us yet another glimpse in to the instinctual sustainability ethos of the tribals.

Kattunaikka women take special interest in collecting Cheruthen, as it is believed to be highly nutritious and medicinal and is best suited for infants. It was never a practice in the past to sell this variety of honey, considered to be very rare and highly nutritious. It is usually found in small rock crevices, on the walls of old bamboo houses, fences and on branches of plants like coffee or teak, which are within easy reach. The collection of this type of honey involves much labour and a great deal of patience, and men normally avoid the task. The honeybees in this case are tiny and tend to stick invariably on the collector's hands and often times all over the body. Removing them is a messy and painful job. Moreover, as Cheruthen is produced in minimal quantities, yielding sufficient quantities involve locating several hives to extract it from. This is another dampener on men's enthusiasm to source this variety of honey. Women in general, on the other hand, ensure that small crevices, old bamboo walls, etc. where these bees nestle are preserved.

Raghavan of Aranamala colony said that ten to fifteen years ago they used to have some sponge-like leaves of a tree called Kuruvil for collection and filtering of honey. The leaves were usually collected by women. He added that women knew the exact localities where this tree species grew.

Other communities like Paniya and Kuruma also collect honey occasionally. The women of these communities hardly involve themselves in honey collection or processing, the exception being the hill Paniyas of Attamala region, who are experts in honey collection like the Kattunaikka, and both men and women are involved in its collection. They market it for cash or barter it for food, clothes, rice, vegetables etc. in the nearby estates. Kuruma men usually collect honey for their own use.

The availability of honey at different times in the wet and dry zones of the district could be due to seasonal variations in the flowering of trees. In wet zone forests, most of the trees flower during winter and summer and in the dry area, the trees flower during or just before the monsoon.

Crabs

Crabs are yet another wild food habitually consumed by the dominant tribal communities of Wayanad (Table 14). Among the tribal and non-tribal communities, the Paniyas collect five kinds of crabs regularly. These are Vellanjendu, Palnjendu, Kundunjendu, Kottinjendu and Karinjendu. All of these varities are abundantly available during the rainy season in habitats like Vayal and Vayalvarambu (paddy field and associated habitats), close to their dwellings. The Kurumas consume three of these, Kolathinjendu (Vellanjendu), Karinjendu and Kundunjendu. Katttunaikka refer to the crabs as 'Nelli' and their names for various varieties of crabs are Kottinelli, Gundranelli, Valanelli, Halnelli and Kallunelli. Except the Halnelli, all the other varieties are consumed by the Kattunikka community. The Halnelli, according to Meenakshi and Rugmini of Muthanga Kattunaikka colony are consumed only by the Paniyas.

Palnjendu is a small crab, found inside the root clusters of paddy seedlings. These are caught while transplanting the paddy seedlings, and along with fish they make a delicious supper. This crab, white in colour, occasionally sheds its outer shell and is then very slimy. During this time it has little flesh and if the legs are broken a milky- juice oozes out

(thus earning it the name Palnjendu). It is not eaten when its shells are shed.

Kundunjendu/ Gundranelli is the smallest crab and the tastiest one as well. Their tentacles are longer, compared to the other crabs. Normally the shell of this crab is brown in colour, and changes to white on ageing. It is found in small holes near Vayal and Vayalvarambu. Kottinjendu/Kottinelli are found in holes on Vayal varambu and nearby wet areas like areca plantations. The shell of this variety has got numerous lines and it is available in plenty during the month of Karkidagam (July-August). It is to be found in areca plantations and seems to thrive inside areca waste. Vellanjendu/ Valanelli found in the paddy fields is pale yellow in colour with lines on the shell. This is the most frequently consumed crab by the Paniyas and the Kattunaikkas.

Other communities (Chetty, Hindu, Muslim and Christian) distinguish mainly two kinds of crabs and have named them based on the habitat. Vayalnjendu are crabs found in paddy fields and Puzhanjendu are those found in rivers. Only the crabs that are found in the river are preferred by these communities. Once in a while, in the summer months, men of these communities do set out in search of crabs. The Chettys of Muthanga sanctuary area recall that about ten to fifteen years back they used to engage Paniya men and women to catch crabs from their paddy fields. This was to check the damage the crabs caused to paddy seedlings. In return the Paniya families were given some rice and, of course, they could take the crabs. Some of the Christian families still depend on the Paniyas to collect for them Karinjendu from the river. Two Paniya men of Choooralmala Ambedkar colony informed us that there was good demand for Karinjendu among the Christians and Muslims and they often catch crabs to sell it to people of these communities.

Gender roles in crab catching, usage and processing

Normally among Paniya and Kuruma communities, the women and children are involved in catching crabs. The men have no deareth of skills in the job either; some of the older male members told us of a variety of techniques in unearthing the crabs from their holes and seizing it without getting hurt on your

Table:14. Crabs in the dietary system of different socio-cultural groups

No.	Paniya	Kuruma	Kattunaikka	Others	Available landscapes
1.	Vellanjendu	Kolathinjendu	Valanelli	Vayalnjendu	Paddy fields
2.	Palnjendu / Muthachinjendu	-	-	-	Paddy fields and associated marshy areas
3.	Kundunjendu	Kundunjendu	Gundranelli	-	Marshy areas and plantations
4.	Kotinjendu	-	Kottinelli	-	Marshy areas
5.	Karinjendu	Karinjendu	Kallunelli	Puzhanjendu	River and streams

fingers. Among the Kattunaikka, as a practice both men and women are together involved in the collection. In general, the morning hours between 7 a.m. and 10 a.m. and the evening hours between 4 p.m. and 6 p.m. are preferred for collection. During these hours the crabs are seen inside the pits and it is easy to catch them. At noon the crabs leave the pits in search of food.

Crab collection

For regular collection of crabs, the Paniyas and Kurumas access nearby marshy areas and paddy fields (within one to two km. radius of their surroundings). Once in a while and during summer months, Paniya women go to the streams in the forests for collecting crabs which can at times take them about ten to fifteen kilometre away from their settlements. Kuruma women never go alone to interior wet habitats for crabs, but collect them during the monsoon season from paddy fields and associated habitats close to their settlements. Vasantha, a young lady of Puthoorvayal Kuruma colony who is an expert in catching crabs finds the Kolathinjendu the tastiest, but feels it is becoming scarce. She did not know why, but many of the elders from the community felt it was mainly because of changes effected to the landscape and due to chemical pollution. The male and female crabs are referred to separately by the elders as Kolavannjendu and Kolathinjendu, respectively. Normally among the Paniya and the Kuruma, women take independent decisions to go hunting crabs and take the children along. Crab catching is often not a stand alone activity; collection of fuel wood, colocasia and other leafy greens also happen in the bargain. Among the Kattunaikka, both men and women set out together for collection, except to the habitats in the close vicinity of their homes, where the women alone go, along with children. Invariably women do the processing.

Women are good at identifying the presence of the crabs judging from the nature of the small soil mount deposited outside the crab's pit. If the mud outside is loose with a small hole in the middle, they aver, the crab would be inside the hole. There would also be bits of grass, which is the waste left by the crabs. In the marshy areas, the crabs are located by pressing the pits with the feet. The crabs make holes with more than one outward opening, which are inter connected. If a crab is present inside the pit, it comes out through another opening. It is immediately caught, without giving it any chance to bite. Catching crabs from the streams is easily done using a small trap made of coconut leaflets. Shyamala and Unnikrishanan of Mutharikkunnu Paniya colony told us that the male and female crabs can be distinguished by the lines on the abdominal side - female crabs have larger Catcha (lines). The pouch like appendage crabs have at the back store toxins, according to them. The conversion of paddy fields has seriously affected the availability of Palnjendu (also called Muthachinjendu), several members of the Paniya community told us.

For catching crabs, Paniya women use a loop like device made of Manippullu *(Pennisetum hohenackeri)* - a stiff grass or coconut leaflets. They tie some

insect on one end and insert it into the crab's pit. When the crab catches the insect with its long legs, they pull out the hook and along with it the crab. Though risky, Paniya women can also be seen catching the crabs occasionally with their bare hands. The legs are immediately removed to avoid the risk of being bitten. Normally the young ones are spared. Leaves of colocasia are used to pack the collected crabs. The Kurumas and Kattunaikkas make no fuzz about catching the crabs with their bare hands.

Fresh water fish

In all the communities, women and girl children do the processing and cooking. Crabs are normally cooked and consumed the same day it is caught and if it is to be kept for the next day, the practice is to boil the flesh with turmeric powder. Paniyas cook it separately or along with colocasia petiole and leaves. The female crabs are considered more tasty and has more flesh as well. Women and elder members of all the three tribal groups said that they never catch young crabs. Paniya women have profound knowledge about the breeding time of crabs. During the month of Karkkidagam (July-August), they avoid catching female crabs as it is their breeding time. If crablings are suspected inside the shell of the female adult, these are immediately released in to wet areas.

Kattunaikka and Paniya use Karinjendu as treatment for lung infection and breathing complaints. Ammini (Ambedkar Kattunaikka colony, 56 years) and Rugmini (Muthanga Kattunaikka colony, 35 years) informed us that crabs are excellent post natal nourishment for women. For ear ache and mouth diseases, the Paniyas use the liquid oozing out from Karinjendu found in the rivers. Crab shells are also used by them for darkening hair. Incidentally, most Paniyas sport thick, shiny black hair that hardly greys even in their advanced years.

Fish

The study reveals that the Paniya community has knowledge of 35 different varieties of edible fish (Table 15). Almost all these species are available throughout the year. Out of these, about 20 are strictly inhabitants of rivulets and streams, but were seen to enter the paddy fields during heavy rain in the past (15 to 20 years ago). The most frequently harvested fish by Paniya are Kalluppatti, Koyma, Konjai, Kannappae, Parel, Kaduvae, Muzhu, and Kommai, which are commonly available in streams irrespective of the season. A big sized fish called Malanjil found in plenty once has now become very rare, says most people. They attribute the disappearance of this species to the chemical pollution of streams from the pesticides sprayed in the plantations.

Gender roles in collection and processing of Fish

Fishing is an important activity for men, women and children among the Paniya community studied. Though fish is available irrespective of seasons, the fishing activity is more during summer as the reduced water levels in the streams makes fishing easier then. There is a flurry of fishing at the onset

Table: 15. Varieties of fish consumed by Paniya tribe and gender roles in their collection

	Local name	Available landscapes	Collected by		
			Men	Women	Children
1.	Mushu	Stream, river	✓	-	-
2.	Kaduve	Stream, river	✓	-	-
3.	Parel	Paddy fields	-	✓	✓
4.	Njenu	Stream	✓	✓	✓
5.	Kalleppatti	River	✓	✓	✓
6.	Koyma	Stream, river	✓	✓	-
7.	Kanneppe	Stream, river	✓	✓	✓
8.	Aaral	River	✓	-	-
9.	Thodameen	Stream, river	✓	✓	✓
10.	Kaichalu	River	✓	-	-
11.	Kalancheppi	River	✓	-	-
12.	Chakkamullan	River	✓	-	-
13.	Chempally	River	✓	-	-
14.	Chethil	River	✓	-	-
15.	Philoppy	Paddy fields, stream	✓	✓	✓
16.	Kottavala	River, stream	✓	✓	-
17.	Malanjil	River	✓	-	-
18.	Thalammakkannan	Stream	✓	✓	✓
19.	Thuppalmkothi	Streams	✓	✓	✓
20.	Pullipparal	Streams	✓	✓	✓
21.	Vattapparal	Streams	✓	✓	✓
22.	Paralam paral	Streams	✓	✓	✓
23.	Kakkaparal	Streams	✓	✓	✓
24.	Thalavannan paral	Streams	✓	✓	✓
25.	Kammai	Streams	✓	✓	✓
26.	Kooriparal	Streams	✓	✓	✓
27.	Attuvala	River	✓	-	-
28.	Pulvala	River	✓	✓	✓
29.	Pullumeen	Streams	✓	✓	✓
30.	Chillumullam	Streams	✓	✓	✓
31.	Choorikoyma	Streams	✓	✓	✓
32.	Cheriyakoyma	Streams	✓	✓	✓
33.	Konchan-red	Streams	-	✓	✓
34.	Konje	Streams	-	✓	✓

of monsoon as well, but this is mainly by women of the Kuruma community. Paddy fields, small canals and springs are preferred for fishing during rainy season, whereas the streams and rivulets are accessed for fish during the summer. During heavy rains, flood waters from the streams bring with them several varieties of fish in to the paddy fields and other low lying areas. Kuruma and Paniya women are capable of approximating quantity and kind of fish available, judging from the intensity and pattern of rain. Fish is caught by them normally early in the morning with bare hands. The presence of fish is identified by slowly walking through the flooded paddy fields. Kuruma men, on the other hand, use Vala (fish net), Ambu (arrow), and Choonda (hook) for catching fish. Kuruma women use a special trap called Chada, made of bamboo splices (Table 16). It is open on one end with a valve like structure and is


Paral

placed against the water current. Once the fish enters the trap, it cannot escape out through the small opening against the current. Making the Chada calls for good skills and placing it aptly needs expertise as well, both of which are the forte of Kuruma women.

Fishing is of ritualistic significance as well for the Kurumas. A practice that has all but died out is that on the third day after marriage, the newly wed bride is escorted by the women of the groom's settlement to the near by stream, where she is expected to demonstrate her fishing skills. After the breaking of pollution on the third day after a death (Pulakuli), men of the household go for hunting and the women for fishing. The fish and meat so obtained are cooked and first ritualistically offered to the ancestral spirits and then consumed by the members of the clan. Vasantha of Puthoorvayal Kuruma colony said that not just ritualistic fishing, even the regular fishing activity is now becoming rare, what with the low lying areas and paddy fields having dried up and the flow in the streams having dwindled considerably. Nowadays their fish requirement is largely met by the market.

Among the Paniya and the Kattunaikka, fishing is a collective effort involving all the family members. Fishing nets or hooks are used occasionally by men. Though it is a collective effort, it is reported by both men and women that the decisions regarding the choice of location, time of fishing and the mode of catching fish are all taken by the men. One common method is to make small bunds across the stream to divert the water flow from the fishing area and reduce the water level. In this temporary water enclosure, Paniya women spread a paste made from grinding the leaves of plants like *Hydrocotyl javanica*. This, after a while, stupefy the fish making them easy for the pick. The big fish which normally is nestled in the crevices in the stream also come out

Table 16. Gender specific skills in fish catching and processing

Sl. No.	Fish catching techniques and tools	Women	Men	Children
1.	Catching fish from paddy fields using bare ands and legs	✓	-	✓
2.	Catching fish using 'chada'	✓	-	✓
3.	Catching fish using net, bait and arrow	-	✓	-
4.	Catching fish by intoxicating with plant derivatives	✓	✓	-
5.	Catching fish by making small bunds	✓	✓	✓
6.	Catching fish using crackers	-	✓	-
7.	Catching fish using clothes	✓	-	✓
8.	Processing	✓	-	-

under its spell, but with sluggish movements. They claim that the application of these leaves never kill the fish or other riverine life. The Kattunaikka apply the stem and leaves of wild pepper in similar enclosures to make the fish movements sluggish.

The women of non-tribal communities are not involved in fishing, even if the stream is in close proximity to their dwelling. In Chooralmala area, some of the Christian and Muslim families depend on the Paniya community for good freshwater fish, which is bartered for rice,vegetables or clothes. It is reported from various parts of the district that fishing through illegal means, using Thotta (a crude country bomb) and Nanju (poisonous plant derivatives), is rampant. It is a past time of men from the mainstream commuities.

Irrespective of the communities studied, women do the processing and cooking of fish. Paniya and Kattunaikka women process big fish like Malanjil by treating it with turmeric powder and salt and drying it. Malanjil, which is becoming increasingly rare in Wayanad is said to possess medicinal properties and is good against rheumatic complaints and breathing disorders.

Analysis of the gender roles in collection of fish by Paniya (Table 15**)** shows that 10, out of 34 species, are collected only by men and three species only by women, while all the other species are collected jointly by men, women and children. The species collected only by men are mostly seen in the big rivers and streams inside thick evergreen forests. Women, evidently, find these habitats inaccessible.

Chapter 5

Discussion

This study has emphasized that wild food forms an ecologically, culturally and socially significant keystone resource that continues to play an important role in the food security and subsistence of poor communities like the Paniya and the Kattunaikka. The men and women of these communities use and manage wild food resources in different ways through traditionally inherited knowledge and wisdom. The study of the gender aspects of food management reinforce the premise that through gender defined occupational roles, the society conditions men and women over the years to develop different sets of knowledge, interests and skills in using resources, whether it be for food, medicine, shelter or recreation. The evidence from this study shows men and women perform different tasks and have various responsibilities in collection, processing and management of wild foods (Table 17).

This table illustrates the varied roles of women and men across communities in conserving some regularly used wild foods. Men are nowhere in the picture of greens collection or management and in the case of tubers, except for the Kattunaikka and Paniya men, others are not involved. Paniya men play a smaller role in collection of wild food compared to their Kattunaikka counterparts. Women in all the communities have a larger role than men in maintaining and supplying the diversity of food plants and animals. Women in the communities studied are accorded the prime responsibility of feeding the family. Gender roles also vary with the social complexity, the kind of wild food environment each community can access, their economic status and the adaptive or access strategy followed by them for utilizing each food resource.

It is estimated that women produce 60% of the food in Asia, 80% in sub-Saharan Africa, 50% in the Caribbean and Latin America and more than 30% in North Africa and the Middle East (Akiko Domoto, 1994). These estimates refer to total food production in which cultivation plays the most significant part. This study reiterates this

Table. 17. Conservation efforts across different communities

Key wild foods conserved	Communities & gender involved								Conservation/management
	K		P		Ku		Ot		
	M	W	M	W	M	W	M	W	
Leafy greens									
Vasala cheera						✓		✓	Conserved in home gardens
Kuppa cheera				✓					Managed in swamps and paddy fields
Mullan cheera				✓		✓			Managed in swamps and paddy fields
Churuli				✓					Managed in swamps and wet fields
Tubers									
Kavala kalasu	✓	✓	✓	✓					Conserved in home garden and managed in close by thickets
Venni kalasu	✓	✓		✓					Conserved in home garden by Kattunaikka
Kottu noora	✓	✓		✓					Conserved in home garden by Kattunaikka
Chembu			✓	✓		✓		✓	Conserved in home garden and nearby swamps and wet fields
Mushrooms									
Arikkoon		✓		✓		✓		✓	Managed by protecting termite mounts
Fruits and seeds									
Njettipana					✓	✓			Conserved in home gardens/and borders by Kuruma
Mango						✓		✓	Conserved in home gardens by Kuruma / Others
Jack	✓	✓	✓			✓	✓	✓	Conserved in home gardens and way sides
Amla	✓	✓				✓			Conserved in home gardens and way side
Crabs									
Paal njendu				✓		✓			Managed by protecting swamps and paddy fields
Honey									
Kombu then	✓	✓	✓	✓					Managed by protecting the honey bees and hives
Fish									
Muzhu			✓	✓	✓	✓			Managed by protecting canals, streams and springs
Kaduvae			✓	✓					Managed by protecting canals, streams and springs
Malanjil			✓	✓					Managed by protecting canals, streams and springs

K - Kattunaikka; P - Paniya; Ku - Kuruma; Ot - Others; M - Men; W - Women

trend even with special reference to women's role in the collection and use of wild food species. Biodiversity and food security interactions are generally viewed at three levels- farm crop level, home garden level and forest level (Balakrishnan Revathi, 2000, Falconer & Arnold, 1991). But it is also true that another level exists at semi-farm or semi-forest level (Borjas, 2001) There are four broad systems of food production but with varied structure and management roles for men and women reported in this study. In forage-fishing-hunting, the basic food production system (system I), women play crucial role in food collection, processing and management; in homestead Farming (system II) of which horticulture is an integral part, food is produced in land primarily by women's efforts for home needs as well as for cash with a supportive role for men (for accessing market); in traditional farming (system III) both men and women are almost equally involved in food production and in modern farming (system IV)- the technology driven system, where food is primarily produced for market with minimal or extremely subordinate roles for women.

Table 18: Communities & gender in relation to different food production systems (FPS)

Food production system	Communities involved	Gender involved	Nature of dependency
FPS I Forage-fishing-hunting	Paniya Kattunaikka (Kuruma women involved occasionally)	Women in main role; Men supportive Both men and women in equal role.	Primarily for food Primarily for food
FPS II Homestead farming	Kuruma	Women in core role, men supportive	Primarily for food partly for market
FPS III Traditional agriculture	Kuruma	Men and women in almost equal role	For both food and market
FPS IV Modern agriculture	Others	Men in core role, women supportive	Primarily for market

Applying this model, the communities studied can be seen to fall under these four systems- Paniya and Kattunaikka are prominently in system I whereas the Kuruma women and men come under system II as well as system III (Table.18). The others fall prominently in System IV except in the case of women of the weaker economic class, for example the poor Muslim women of the study sites.

In the present study, two main communities studied, the Paniya and the Kattunaikka who come under food production system I, bear out the links between gender relations, the conservation of wild food and biodiversity. The Paniyas are fine example of a community that depend heavily on the semi-wild environment for their food and other needs. Historically, they were bonded labourers, who had to involve in streneous labour in their masters' fields from dawn to dusk. The wages paid in kind (a fixed measure of paddy, most often) along with the food gathered from the wild contributed to their diet in the past. The situation still continues that they live neither as a purely forest-dependent community nor as full time agricultural producers. They are efficient in managing the disturbed semi-wild environment that traverse paddy field-margins & bunds, irrigation canals, thickets, road-sides and home gardens, containing a substantial number of species and varieties. The men and women of this community have acquired knowledge on 222 wild edible species, most of them accessed and utilized from this disturbed environment. Traditionally, they accessed the forest ecosystem to trap small animals or dig root tubers and the agricultural fields to gather greens or to catch fish and crab, which formed a major source of their animal protein.

The Kattunaikka who live in the forest environment stand next to the Paniya for their knowledge and dependence on wild food for sustenance. They possess knowledge of 177 wild food species while Kuruma, an agricultural group, knows only 88 species/varieties. Among others, the resource poor Muslim women access the semi-wild environment for food, particularly greens, and some among the Christian men, who form the middle peasantry, exploit the forest for game meat.

An examination of the pattern of accessing wild food from various landscapes by the different communities (Figure 19) bears out the following: The Paniya community successfully explore all the landscapes ranging from forests to grazing lands; but more from the habitats outside forests- thickets, plantations, paddy fields, swamps, waysides and grazing lands/mountains. The Kattunaikkas, on the other hand, forage mostly the forests and the Kurumas access the plantations and paddy fields. The non-tribal communities access largely three

Figure 19: Dependency on landscapes across communities

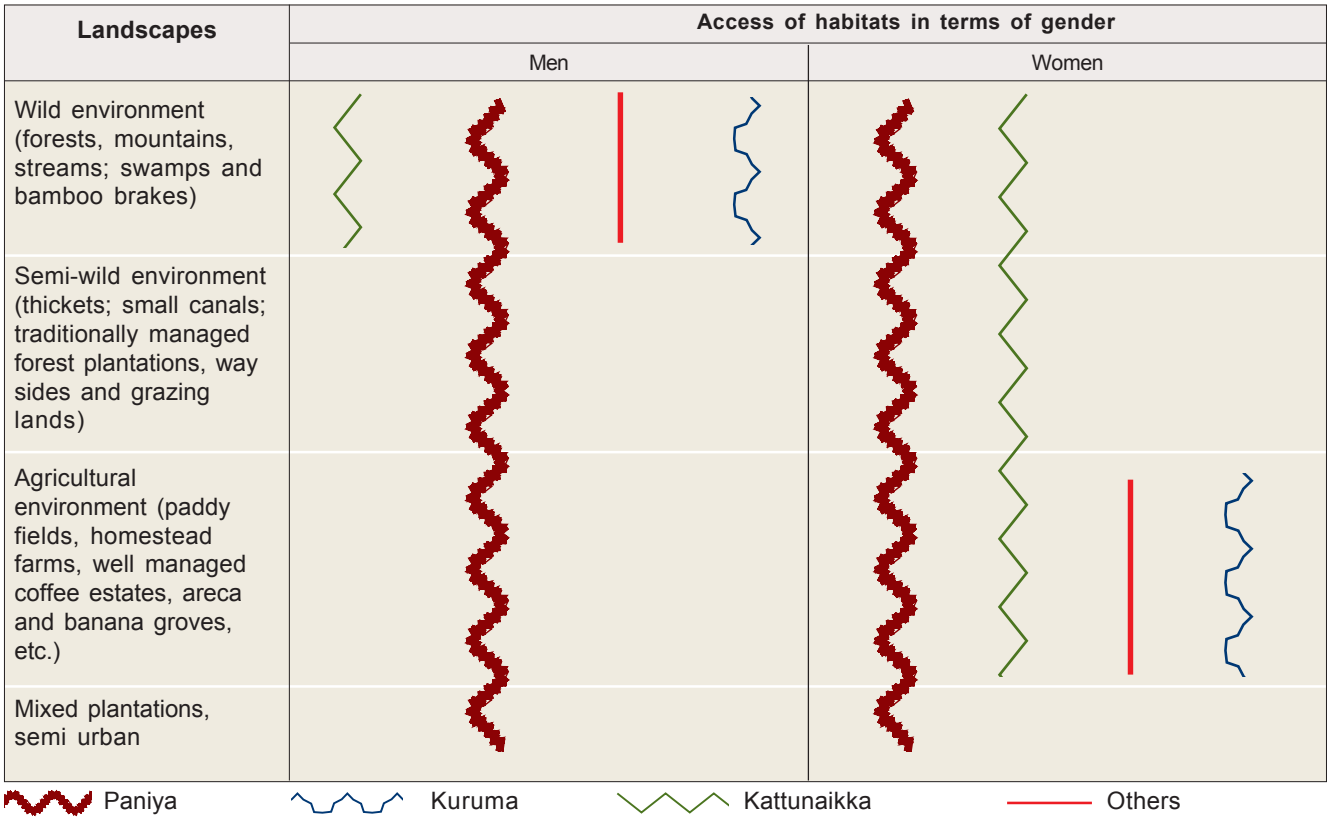


Table 19. Utilization of various landscapes by different communities

Landscape type	User communities (in the order of dominance)				Key wild food used			
	KN	P	Ku	Ot	KN	P	Ku	Ot
Forest	3 *	2	2	1	T; Fr, M, Mu	T; Mu	M	Fr
Thickets	1	3	1	1	LG	LG; Fr; T	Fr	LG
Plantations	0-1	3	2	1	LG/ Mu	LG; Mu	Mu	Mu, LG
Paddy fields	1	3	2	1	LG	LG; F; Cr	LG; F, Cr	LG
Streams/river	3	2	1	1	F, Cr	F, Cr, Sn	F	F
Swamps	2	3	1	0-1	F, Cr., LG	F; C, LG	F, LG	F
Waysides	1	3	1	0	-	LG; Fr.	LG/Mu	-
Grazing lands/mountains	1-2	2	1	0	LG; Mu	LG; Mu	Mu	-

*value based on the number of species each community access from each LS type. 1 - minimum; 3 - maximum. T - tubers; M - meat, Mu - mushrooms; LG - leafy greens; F - fish; Cr - crab; Fr - fruits

landscapes- the paddy fields, thickets and plantations to collect only the most valuable species or varieties (Table 19). Though they access only very few species, those are the most valuable, for example, Garcinia - which is in high demand and is widely collected and animals like rabbits, boar, and sometimes sambar, which are hunted by the men of non-tribal communities.

The table clearly indicates that the Paniyas access almost all the landscapes for wild food and Kattunaikka have more access to forests and rivers for wild food collection. The inference that they also

Table 20: Gender in access of landscapes for wild food collection (except in case of Kattunaikka)

Landscape type	Distance range from home (Kilometers)	Regular access		Key food resource collected
		Far 5 to 15	Near 0 to 5	
Forest	5 to 15	Men	-	Game meat; tubers and honey
Thickets	3 to 8	Men	Women	Fruits/seeds & greens, game meat
Plantations	1 to 5	-	Women	Mushrooms
Paddy fields	0 to 5	-	Women	Greens and crabs
Streams/river	0 to 15	Men	Women	Fish
Swamps	0 to 5	-	Women	Crabs; small crustaceans, greens
Waysides	0 to 5	-	Women	Greens
Grazing lands	0 to 5	-	Women	Greens
Mountains	8 to 15	Men	-	Tuber, honey

contribute the maximum to wild food conservation is vindicated through their management and sustainable usage practices discussed elsewhere in this study. Except in the case of Kattunaikka, the landscapes which are accessed by women are closer to their homes while the ones farther away are accessed by men (Table 20). The social value of the resources often varies not just according to the power and prestige of the community that access the resources but also according to the gender involvement in its collection. The temperament, gender value, cultural identity and perceptions of social status are very distinct among the communities studied.

It is also evident from this study that gender differences expressed in terms of attitudes and preferences are the deciding factor in collection and consumption pattern of wild foods. Generally men of all communities, including the Paniya, even when they actively partake in wild food collection out of necessity, consider it an inferior task that affect their social status (Table 21). Consequently, the attainment of better economic status results often in wild food collection being given a go-by, as is the case with the Kattunaikkas of Aranamala. Women of socially and economically well off communities too do not go for collection of wild food. The Paniya community do not consider hunting proper to be their domain and seldom use bows and arrows or guns, which is a privilege enjoyed only by the Kurumas or

Table 21: Communities & gender in relation with the wild food collection

Food	Community involved	Gender involved
Wild greens	Paniya	Core role women , supportive role children
Tubers	Kattunaikka	Core role Men; women supportive
Fish	All tribal communities	Both men and women
Game meat	Kattunaikka, Kuruma, Others	Men only among Kuruma and Others; women supportive role in Kattunaikka
Fruits & seeds	Kattunaikka, Kuruma; occasion ally Paniya	Both men and women
Mushroom	All tribal communities & women of poor Muslim and Christian	Women; occasionally men
Honey	Kattunaikka; Paniya; occasionally Kuruma	Core role for men; women supportive

non-tribal communities. The small game that they access is mostly with the aid of traps. The Kattunaikkas who by virtue of being in the forests do occasionally access wild meat, consider it far less significant to them than tubers or honey. Except in the case of Kattunaikka, only men engage in hunting for wild meat. In the case of fishing, excluding the women of economically well off class, involvement of both men and women is the accepted norm. The Paniya community stand out on the score of gender participation in wild food collection; the women partake of all activities related to accessing wild food, but for hunting.

Tribal hierarchy and knowledge related to wild food

An attempt was made at Muthanga Sanctuary in the dry zone of the district to study the social hierarchy among the four socio-cultural groups- Kattunaikka, Kuruma, Paniya (the tribal communities) and Wayanadan Chetty (a non-tribal community) in the consumption of different wild foods. The study shows that different communities have varied preference towards different wild food species and attach values to them based on their social status. Kuruma and Kattunaikka know that Noonji (a kind of snail) is a safe and edible delicacy which is available in plenty in wet areas like paddy fields and shallow streams, but they do not include this in their food. When asked about this they said 'only the Paniya consume Noonji'. It is considered a matter affecting social prestige to consume it as food, but when prescribed as medicine for certain ailments, other communities show no hesitation to consume it. Such differences were also observed in case of some leafy vegetables, mushrooms, tubers and crabs. Maracheera (*Embelia tsjerium-cottom*) is a kind of green widely consumed by Kattunaikka, but no other community in this area eats this species even though it is available in their vicinity. Likewise, Kattunaikka only consume tubers such as *Dioscorea pubera* and *Dioscorea hamiltoni*. These are instances that reflect how a landscape is accessed and managed in different ways by different communities in different seasons.

However it is observed that families of Wayanadan Chetty consume many species that are consumed by Paniya. The same nomenclature both the communities use to describe many of the wild food species is, in a way, indicative of the common knowledge that they share about the use of these species. But the Chettys avoid certain species consumed by the Paniyas, which require strenuous processing to make it edible. It is observed that the Wayanadan Chettys encourage the Paniyas to catch crabs from their paddy fields as a crop protection mechanism as the crabs damage the paddy seedlings. It was not very evident from the survey, whether the Paniya have been privy to any knowledge that was the preserve of the Chettys, but the Chetty women, whom the study records to have knowledge of about 19 leafy greens acknowledged that they came to know of the uses of several herbs from the Paniya women. But in the case of mushrooms they won't entirely rely upon the Paniya's knowledge and many varieties of mushrooms that the Paniya women make edible through processing are considered deadly poisonous by the Chetty women. Similarly, the Chettys are indebted to their Kattunaikka labourers for much of their knowledge about edible tubers and they identify most wild tubers by the names that the Kattunaikka use for various Dioscorea species.

There is insufficient sharing between various forage communities of the knowledge regarding wild food that each community is privy to. The reasons are not yet clearly understood. It may be a marker of cultural and social identity of each community. Group rivalry might also be playing its role. This was more evident between the powerful and autonomous clans of the same socio-cultural group like the Kurumas. It is also possible to view this as some kind of a management approach for allocating and accessing different resources by different communities. No doubt, social hierarchies among the tribal communities and between tribal and non-tribal communities do play a role in traditional knowledge remaining, by and large, each community's preserve.

Box. 4

Wild Food management strategies of Paniya- a comparative analysis of wet and dry zones

A comparative analysis between the two-agro climatic zones of the district shows that the wild food diversity and management strategies of the Paniya community highly vary between these two zones (Table 22). While the Paniya men and women of the wet zone know about 146 wild foods, those of the dry zone know only 84. This can be attributed to the ecological differences between these two zones, where high rainfall play a major role in increasing the richness of biodiversity in the wet zone. The seasons for many of the wild food species also vary between these two zones, for example, while tubers are collected from the month of December onwards for about three months in the wet zone, this activity starts in the dry zone much earlier (during September) and lasts for about three to four months. During the month of September tubers are also collected in the wet zone, but the quality is better if collected in December or the following months. The gender differences in collection and processing also vary between two sites. In the dry zone where the Paniya community depends more on the forest, differences between gender are minimal compared to the wet zone. For instance, in the dry zone women and men always go together for the collection of tubers, but in wet zone this activity is normally done only by men. There is greater involvement of men in the dry zone in the processing of wild foods like tubers, fish and mushrooms compared to the wet zone, where it is the responsibility of women and girl children alone. The landscapes like marshy areas and paddy fields are accessed only during the rainy season in the dry zone, because these areas quickly become dry after the monsoon recedes. But in the wet zone these landscapes remain potential access points almost throughout the year.

Table 22. Wild food management by Paniya- wet and dry zones.

Details	Wild foods	Wet zone (No. of plants collected)	Dry zone (No. of plants collected)
Wild food consumption	Leafy green	56	17
	Mushrooms	16	13
	Fruits	30	17
	Tubers	19	16
	Fishes	15	11
	Crustaceans	5	5
	Honey	5	5
	Total	146	84
Wild food dependency	Dependency on landscapes	Depend more on paddy fields, marshy areas and other low lands for wild food collection	Depend more on forest for wild food collection and other income-generating activities
	Seasonal dependency on landscapes	Depend on forest only during summer	Depend on forest through out the year
	Availability of wild foods	Get more leafy greens due to the abundance of marshy areas and paddy fields	Marshy areas are less, get more tubers and mushrooms
	Gender roles	Role of men in the collection of wild foods is less	Involvement of men in the wild food collection is more compared to wet zone.

Declining knowledge of Paniya about wild food

The knowledge of the Paniya community about wild food is declining drastically as a result of the in creasing alienation of the younger generation from the collection and management of wild food resources. The reasons for this vary - accessibility and availability constraints is one, the intrusion of mainstream values that deride or look down upon the practice is another, but an intriguing factor is also school - increased enrolment of tribal children in schools that are least attuned to the realities of tribal life, leave the tribal children with no time or inclination to forage for wild food!

The decline in traditional knowledge related to wild food from one generation to the next is a stark reality thrown up by the study. An exercise carried out among 12 males and 12 females, representing three generations among the Paniya in Mutharikunnu colony brought forth the alarming rate of decline in the knowledge about wild food among the Paniya community, which is reflective of the general trend among the tribals as a whole (Table 23). The sharpest decline is noted in identifying edible yams and in the traditional method of catching fish and crabs groping with the feet in shallow waters. None of the children in the group could identify the edible from the non-edible yam, leave alone the different varieties among them. The children were also inept at several of the fishing techniques that their elders were adept at. This decline has occurred suddenly in the third generation, though not so much between grandparents and parents. In the case of identifying yams, men and women of parent and grandparent generation are equally knowledgeable, whereas in catching fish groping with the feet in shallow waters, there is knowledge erosion noticed at the parental generation level itself. In the case of catching crabs, knowledge is still common among women of the parental generation. Male children know none of the skills tested, indicating the fast rate of knowledge erosion among the Paniya. Except for mushrooms and greens, the female children are also not familiar with wild food collection. It is obvious that the decline in knowledge has been the steepest between the second and third generation. Lack of interest in children is a common refrain from the community. The survey also indicates that the children, especially those who attend school are barely aware of most of the wild food species, except for some fish and some birds like crane. Female children know about leafy greens and mushrooms, as they continue to accompany their mothers or grand mothers for collection. Male and female members of the parental and grand parental generation are very knowledgeable about wild food. They still prefer these over what the market has on offer and seldom lose an opportunity to collect them. There is general agreement on declining availability of wild food. The reasons for the decline are also common knowledge, such as landscape conversion, habitat destruction, invasion of alien species like Parthenium and Ageratum, restriction from the forest department, forest fires, etc. Maintenance of crop biodiversity has a direct link to traditional knowledge system. Given this, efforts must be made in conserving traditional knowledge starting with a 're-education' of children.

Table 23. Erosion of traditional knowledge of Paniya on wild food

Attribute	Number of persons possessing knowledge across the age groups					
	>40		15 - 40		<15	
	M	F	M	F	M	F
Identifying edible mushrooms	3	4	2	4	0	2
Identifying edible yams	4	3	3	3	0	0
Identifying edible greens	2	4	1	3	0	3
Fish catching techniques	3	4	2	2	0	0
Crab catching techniques	3	4	2	4	0	0

Perceptions and preferences

The perception of Paniya men, women and children of different age groups in the study sites about the different wild edible greens, their preferences and its availability was documented (Table 24). Many of the members interviewed, especially women in the above 40 age group opined that many of the regularly consumed leafy greens are not available now as they used to be in the past. Invasion of alien species, rapid conversion of paddy fields and the heavy infusion of chemical fertilizers in the soil were the reasons they cited for the steady decline in the availability of several varieties of leafy greens.

Age group of 10-15: The school going tribal children, in general, displayed a distinct lack of awareness about most of the wild foods, except for fish and some birds like crane. Never the less, girls displayed better knowledge about leafy greens and mushrooms, probably because it is still a practice for them to accompany their mothers or grandmothers in the collection. They also displayed greater knowledge about the seasonal availability of many species of leafy greens and mushrooms and the landscapes where they are commonly found. Boys know more about fish and fruits compared to girls. Compared to the girls, they also know more about the geography of nearby hills and rivers. The children of this age group prefer food accessed from the markets to that available from the wilderness.

Table.24. Perception of Paniya men and women regarding wild foods and its availability

Age group	No. of wild food species know							Preference	Remarks
	L.V	Tb	Ft	Mh	Fh	Cb	Hy		
Below 15-M	7	2	12	4	16	2	3	Prefer marketed foods and wild fish	Not regularly involved in wild food collection
Below 15-F	16	2	10	9	10	4	2	Marketed food, crabs and wild fish	They go for wild food collection along with the elders, have a clear idea about the different habitats where wild foods are available
15-40-M	13	5	14	6	22	3	4	Marketed foods and fish	Not regularly inbut ion that wild foods available in plenty in different habitats
15-40- F	26	4	10	12	14	4	4	Leafy greens, mushrooms, crabs and fish	Preferring wild food but not regularly involved in wild food collection, have the opinion that many of the wild foods are getting rare
Above 40-M	14	14	18	17	26	4	5	Tubers, mushrooms, crabs, leafy greens and fish	Still prefer wild food and involved in the collection of tubers and fishes, have the opinion that the wild foods are getting rare and are well aware about the reasons
Above 40- F	42	12	13	21	20	4	5	Leafy greens, tubers, crabs, mushrooms and fish	Every day they go for leafy vegetable collection, have the opinion that the wild foods are getting rare and are well aware about the reasons

LV-Leafy greens; Tb-Tuber; Ft-Fruit; Mh-Mushroom; Fh-Fish; Cb-Crab; Hy-Honey

Age group of 15- 40: No too long ago, both the males and females of this age group used to get regular jobs in the field or in forests. The situation has now drastically changed, and this has largely affected the job opportunities for women. Conversion of paddy fields and the application of herbicides in the place of manual weeding in different plantation sectors have had a telling effect on their employment. Worse still, the constant onslaught of mainstream societal values have instilled in them the feeling that gathering wild food is demeaning. Almost 80 % of the respondents from this age group responded that wild foods were there in plenty in different habitats but they were not interested in venturing out to collect them. Instead there was a marked preference to access food from the markets, even as they knew that affordability was an almost insurmountable deterrent to buying food from the markets. The only wild food they seemed interested in was fish.

Women in this age group still prefer wild foods like leafy greens, mushrooms and crabs to marketed food and they know more about leafy greens and mushrooms compared to the men. But their dependency on specific habitats to regularly access wild food has reduced. Instead, they seem content with gathering the leafy greens and the occasional mushrooms that they come across while wandering about in search of fire wood. Their intake of wild tubers has also drastically reduced because of the reluctance of men to accompany them in to the forests. On the matter availability, almost all of them are of the view that many of the wild foods are becoming rare or are totally disappearing. An exception to this are the tribals who live inside the forest areas (In the dry zone – Muthanga colony). The women there still venture in to the interior forests for tubers and other wild food accompanied by men.

Age group above 40: Both the men and women of this age group have profound knowledge about wild foods. Despite the onslaught of modernity, they still prefer such food to those that can be fetched from the market and frequently venture out for their collection. They are also acutely conscious of the reasons behind wild food getting scarce by the day: landscapes giving way to constructions, habitat destruction, invasion of new species (they used to get enough leafy greens from way-sides and open areas, but now these habitats are completely occupied by invasive species like *Parthenium hysterophorus, Ageratum conyzoides* etc.), restrictions imposed by the Forest Department in accessing wild food from the forests, forest fires; and the threat of attack from wild animals while venturing in to the forests in search of wild food.

Decline in knowledge on wild foods collection techniques among Kattunaikka

The decline in knowledge related to wild food in successive tribal generations is a reality for the Kattunaikka community as well. An exercise carried out among three generations of the Kattunaikka community revealed a trend not very different from what was obtained in a similar exercise with the Paniyas. Ten attributes were tested among the respondents asking direct questions about their knowledge related to identifying, accessing, processing and management of wild food. (Table 25).

A total of 120 individuals were in the sample. The informants were divided into three age groups: 5 to 18, 18 to 40 and above 40. The results show that the sharp decline in knowledge transfer has been between the 2nd and 3rd generation. More than seventy percent of the children pleaded ignorance on every single attribute tested. The girls showed marginally better knowledge compared to the boys, being reasonably better informed about mushrooms collection and processing. The sharpest decline in transfer of traditional knowledge is noticed in the identification of edible yams, processing of root tubers like colocasia, extraction of palm powder and in the art and technique of tree climbing. It was surprising to note that a majority of the boys could not negotiate even short trees, belonging as they are to a community whose men climb dizzying heights to access honey. It is also noted that children who

Table: 25. Decline of knowledge among Kattunaikka

Attributes	Individuals who possess the knowledge (%)					
	5 to 15		15 to 40		40 above	
	Male	Female	Male	Female	Male	Female
Crab catching techniques	+	+	+	*	*	*
Processing of colocasia & Kattupayaru	x	x	+	*	*	*
Processing of mushrooms	x	+	+	*	*	*
Identification of dioscorea	x	x	*	+	*	*
Honey collection techniques	x	x	*	*	*	*
Dioscorea- management techniques	x	x	*	*	*	*
Knowledge about edible mushrooms on different trees	x	+	+	+	*	*
Main causes of depletion of wild resources	x	x	*	*	*	*
Extraction of palm powder	x	x	+	+	*	*
Tree climbing	x	x	*	x	*	x

x Less than 30 % have the knowledge **+** Above 50 % have the knowledge * Above 80% have the knowledge

attend school are barely aware of most of the wild food species except for fish and crabs. The limiting role of school in the transfer of traditional knowledge in this community is akin to what the school does to the Paniya children. The second generation (age group 18 to 40) of Kattunaikkas had a relatively sizable percentage who were knowledgeable about most of the attributes and continue to prefer the wild food to those available in the market. More than 80% of men and women of this age group were equally knowledgeable in attributes like honey collection and dioscorea management. They were also quite conscious of the reasons for the depletion of wild food resources. But many of the men and women of this age group did not know how to extract sago (palm powder) from arenga and caryota palm and to identify the epiphytic edible mushrooms. Women in this category were better informed than men on techniques like catching crabs and processing colocasia and mushroom. The respondents of age group above 40 stood relatively well in all the ten attributes, but for tree climbing, where women across age groups, expectedly, did not report any expertise.

Change in gender roles and perceptions- Kattunaikka:

Till about two decades ago, wild food constituted a greater portion of the food intake of the Kattunaikka community. There was near equal role for both men and women in every dimension of wild food collection and management. The income earned from the marketing of wild food like honey, garcinia, gooseberry, etc. was spent for the family as a whole. The Kattunaikka were once completely a foragers group where men and women equally contributed to greens collection, tuber digging, hunting, fishing and other jobs. For the collection of much preferred leafy greens like Marakeera (*Embelia tsjeriam-cottam*), men and women went together to the interior forests and men collected the tender leaves from the upper branches of this small tree.

But the trend has changed steadily after 1980's. The changes in land use pattern, restrictions in accessing the forest, developmental interventions, etc. have been cited as the causes. It is observed that gender roles change in relation to changing socio-economic contexts. Now gathering greens is generally women's work as in the case of the Paniya, Kuruma and other

settled communities. However, in certain study sites, for example in Muthanga and Aranamala, Kattunaikka women are now engaged in food production; tending to small home gardens where wild food species collected from the forests have been introduced. They are aided in this by their men who collect various wild species from interior forests. In Aranamala area, the food basket of the Kattunaikka settlement has reduced considerably as a result of devoting their entire land holdings to the cultivation of cash crops. In terms of wild food management this trend has ultimately resulted in discarding various plants and animals once relished in their diet. The cash crop economy has also resulted in all the associated structures of property owning mainstream patriarchal society seeping in to the community. A sharp increase in gender inequality has been observed in household decision-making and opportunity level (Box 5). The income accrued from the cash crops are solely concentrated in the hands of men.

The tubers that the Kattunaikka women have sought to introduce in their fields too bear out the truism- what is conserved is related to who collects it. The preference is for varieties fit for making side dishes and not the ones good for roasting or steaming, which constitute full meals in themselves. Women also lay stress on species that are not commonly found in localities in the vicinity of their habitats. As noted, Kattunaikka women take special interest in collecting Cheruthen, a highly nutritious and medicinal honey that is ideal for infants. It was never a practice to sell this rare variety of honey, for the collection of which the Kattunaikka women undertook much pain and

Box. 5

Changes in gender role of the Kattunaikka with the changing socio-economic scenario

The inhabitants of the Bhappanammala Ambedkar Kattunaikka colony are dam oustees, who earlier resided within the forests. They now venture in to the forests for honey and tuber collection no more than twice or thrice a year. Wage labour, when available give a semblance of economic independence for the adult men of the colony. The youngsters, both male and female, of this colony do not prefer wild greens and normally avoid accompanying the elder women to collect such food supplements. It is also observed that women are not engaged in wage labour more out of custom and because they are heavily tied up in the household domain. Their mobility for wild food collection is also getting limited as the distance to the forest, consequent on resettlement, is greater and the men are disinterested in providing accompaniment. While the women of this colony expressed their preference for edible wild greens and tubers, accessing the distant forests alone without men is seen to be unsafe.

Members of the Aranamala Kattunaikka colony are economically well off because of their switch to cash crop economy, aided by a Governmetn scheme. Even though they live very close to the forest, their dependence on the forest is negligible. Reasonable acerage of land and a scheme to cultivate the more lucrative cardamom provided by the Government has meant better earnings. Cardamom cultivation involves all the members of the households including children, but it is the men who market the produce and handle the cash. Some elderly women of this colony still collect greens like Aliyanchappu and Palankheera since they relish them, but most men dissuade them from foraging for such wild greens. Here too, men's earnings have increased not just their mobility but also their decision making power which now stretch to what women and children should & should not eat. The changed scenario has affected not just their eating habits, but also the management of food diversity and their knowledge of wild resources. The consequent alienation from their traditional lifestyle is

labour. Women's perceptions about the value and usefulness of a product plays a significant role in the effort they lay for its sourcing, preservation and management.

The Kattunaikkas are involved Prominently in wild food marketing. Nellikka (*Emblica officinalis*), Poopal (lichen species), Kodampuli (*Garcinia gummigutta*) and honey are the most widely collected non-wood forest products and these are important sources of income for their families. Both women and men are engaged in the collection of all these products. The leadership for collection and sale lies with men. While the competition for accessing these products have increased, it has not pushed the Kattunaikka men and women to resort to the unsustainable harvesting practices that the mainstream communities habitually engage in. They would not, for instance, bring down the entire fruitescent branch of a gooseberry tree, just because it is convenient to collect the fruits from the grounded branch.

Economic benefits - a new phenomenon of selling wild food

The sale of small forest produce in the market by the tribals is an established practice. These were mostly products that had commercial value, served as industrial raw material, or which had been regularly consumed by the mainstream communities. But a new phenomenon that the study uncovered was the sale by the tribals of wild food which traditionally have been used only for self consumption. Surprisingly, it is the paniya tribals from the remote and secluded Attamala hills, near Meppadi who have been in the forefront of the practice. This community, it is learned, sells wild food like fish, fruits, mushrooms, roots, tubers, honey and also several minor forests products such as fuel wood, reeds, rattans to generate income. One of their tribe play middle man for the transaction, but of late some members have been selling to the mainstream community on thier own. As fish fetch a decent income, it is the preferred item brought to the market, though it is sold at prices far lower than what is obtaining in the market for fresh water fish. Wild food is sold to households directly, the transaction is women to women mostly and only occasionally it reaches the market place, if the quantity available is very large. Women pay them in kind, with grains, clothes, old vessels etc. There is high demand from housewives for items like crabs particularly the Paranjandu (crab associated with rock) and Karinjandu (crab which is black in color) which are said to possess medicinal value. The other important wild food items that have sale value are honey, gooseberry, and garcinia, generally collected by men.

Out of the 16 fish varieties, they sell only 4 in the market. Both men and women play an almost equal role in the fishing activity, but men prefer to catch marketable fish using fish traps, while women and children prefer to catch the varieties meant for self-consumption. When the market demand for fish increases, all of them concentrate on catching the varieties that find favour in the market. The inhabitants of this hamlet collect approximately nine varieties of tubers; out of them three are marketed. Difficult and tedious processing required for the rest keep them away from the market. It is also likely that the limited cross-social mobility of women, who are the knowledge holders on the processing of most varietuies of wild food, limits its market acceptibility. Fruits, tubers and honey are an important part of the diet of the community and only 3 kinds of fruits (gooseberry, garcinia and tender mango) are being marketed out of about 39 fruits collected. Wild species such as pepper, thippali, ginger, turmeric etc., are but collected exclusively for market and are among the traditiional minor forest produce. Men and women play an equal role in collection of such wild spices. The money from the sale of wild food and minor forest produce is generally used for purchasing provisions, household necessities, betel leaves, tobacco, etc.

Like the Kattunaikka, equal involvement of both men and women in most of the tasks in collection of food can be seen in this group also, illustrative of how gender roles vary with environment and

adaptive strategies. It was learned that the men, women and children of all ages go as a team in search of food with much interdependence of roles. The women of the group play an important role in the collection of most of the food sold including in locating honey, garcinia, tubers etc., in which they have developed unique expertise. The marketing of wild foods has resulted in changing the perception of the youth of this settlement towards wild foods. The market earnings of wild food is now proving to be an incentive for Paniya families who live outside the forest to go in search of them. The money from the sale is often spent on purchasing rice and occasionally for eating out. This is an interesting dimension - a growing appetite in the tribals for the near junk food popular with the mainstream communities and the new found interest in wild food by some sections of the mainstream community.

Women engaged in vegetable cultivation

Wild foods in homestead and traditional agricultural systems of Kuruma

In the social hierarchy of tribal communities, the Kuruma men and women enjoy greater power and personal freedom. They are a land-holding community with good knowledge and experience in cultivation of food and now cash crops. The Kurumas exploit landscapes of agricultural environment (paddy fields, homestead farms, coffee estates, areca/banana plantations etc.) for wild food. Though previously gathering, fishing and hunting contributed much to the diet, now the focus of sourcing food has shifted to cultivation in their own lands, where men have the dominant role. The social status of women of the community who engage themselves in their homestead gardens for growing food is greater than those who forage for it in the open spaces and wilderness. Similarly, men find it more dignified to confine themselves to traditional or modern agriculture, producing food or cash crops than to source wild greens, meat or fish. Compared to the other tribal communities studied, men and women of the Kuruma community show greater involvement in cultivation, with the homestead gardens being the women's domain, while men concentrate on the paddy fields. While women's contribution in paddy cultivation itself is substantial, men have a limited role in the cultivation and management of horticultural products. Invariably, in all the Kuruma households, there are home gardens, which are maintained well by women (Table 26). These home gardens are rich with several leafy greens, roots, tubers, legumes, fruits and plantains. About 15-20 species were found in these gardens.

Kuruma women decide on the species and varieties of greens to be cultivated and collected. From the wild they collect in all about 88 species and varieties for food, which is far less compared to Paniya (222) and Kattunaikka (177). Among wild foods, fish comprise the larger share with 25 different kinds followed by leafy greens (21), fruits and seeds (15), and tubers (12). Kuruma women are exceptionally skilled at catching fish, which often contribute more to the diet than hunting, which is increasingly turning namesake and ritualistic. During the monsoon, women initiate fishing activity, involving the children as well. Paddy fields, small canals and springs are preferred for fishing during the rainy season, whereas the streams and

Table 26. Vegetable plants grown in the homestead farms of Kuruma

Scientific name	Local name	Parts used	Nurtured and harvested by
Moringa oleifera	Muringa	Leaves, fruits	Women
Cucurbita maxima	Mathan	Fruits, leaves	Women & Men
Benincasa hispida	Kumbalam	Fruits, leaves	Women & Men
Amorphophalus companulatus	Chena	Corm, leaves, stem	Women
Colocasia esculenta	Palchembu	Rhizome, petiole, leaves	Women
Colocasia esculenta	Thondichembu	Rhizome, petiole, leaves	Women
Colocasia esculenta	Makkalae potti	Rhizome, petiole, leaves	Women
Musa paradisiaca	Nenthravazha	Fruit	Men & Women
Musa paradisiaca	Mysore vazha	Fruit, pseudostem, inflorescence	Men & Women
Musa paradisiaca	Moris	Fruit	Men & Women
Musa paradisiaca	Nadan poovan	Fruit	Men & Women
Musa paradisiaca	Gandha pacha	Fruit	Men & Women
Musa paradisiaca	Njalipoovan	Fruit	Men & Women
Musa paradisiaca	Pesaka vazha	Fruit	Men & Women
Abelmoschus esculentus	Vendakka	Fruit	Women
Vigna anguiculata var.	Payaru	Leaves, fruits	Women
Vigna anguiculata	Kuttipayaru	Leaves, fruits	Women
Psophocarpus tetragonalobus	Chathurapayar	Leaves, fruits	Women
Dolichos lab lab var.lignosus	Amara	Fruits	Women
Solanum melongena	Vazhuthana	Fruits	Women
Carica papaya	Kappaka	Fruits	Women
Lycopersicum esculentum	Thakkali	Fruits	Women
Basella alba	Vasalachappu	Leaves and stem	Women
Luffa acutangula	Peechinga	Fruits	Women
Lagenaria siceraria	Cheranga	Fruits	Women

* Trees not included

rivulets are accessed for fish during summer.

Kuruma women maintain a wide diversity of food through wild plant collection, home gardens, and managing wild growth on the fringes of paddy fields. While the women focus on managing domestic consumption by tending to the home gardens, protecting the wild green growth in the surrounding landscapes, raising cattle, poultry, etc. in addition to contributing substantially to the cultivation of paddy, the men concentrate on commercially valuable crops like coffee, pepper, banana, ginger and areca. Thus while men dominate the production of crash crops and handle the cash, women are largely confined to the domestic sphere (both in the house, paddy fields and home gardens). Kuruma women have a greater burden of work and share a larger share of the responsibility for the family food security. Suffice to say that among all the three tribal communities, gender relations seem most unequal within the most affluent group, the Kuruma.

Implications of development and the changing scenario

Conversion of paddy fields

The paddy fields of Wayanad had been a veritable treasure trove of a variety of leafy greens and a host of other wild food, regularly accessed by the tribal communities, especially the Paniyas and the Kurumas. Paddy fields, as they existed nearly two

decades ago in Wayanad, provided food, employment and ecological security to the tribals. Apart from greens, a number of other species of high food and health value such as fish, crustaceans like crab and snails, and medicinal plants were associated with this agro-eco system. The tribal communities like Kurichya and Kuruma completely relied on paddy cultivation and this ecosystem for their food security. The Paniya community depended on paddy fields for employment. Women of this community were among the most adept at all tasks related to paddy cultivation and they depended on the wage earnings from it as their principal source of income. The paddy fields were also among their principal sources for a variety of wild food. Even today, the Paniya women know and use 19 plant species from the paddy fields and its mud bunds. Besides this, a number of rituals and traditions of the Paniya, Kuruma and Kurichya communities are strongly intertwined with this ecosystem. From an ecological view point, the paddy fields situated in the low lying areas of the undulating Wayand terrain acts as a trough collecting and retaining a large quantity of water that is used by a number of plants and animals (most of them, of direct use to the dependent communities). Conversion of this land for cultivation of perennial crops (or, as is the recent common practice, for banana cultivation) limits the storage capacity of this "sponge" leading to water shortages in nearby wells during dry seasons, and floods during rainy seasons.

Paddy fields in the district, which once occupied a major portion of the cultivable area, have now reduced considerably – from an area of 21770 ha in 1990 to 8725 ha during 2000. This agro ecosystem is under increasing threat in the form of habitat loss, land reclamations and other alternate unsustainable land use. The shift in land use from paddy cultivation to the banana crop, with its attendant reduction in the water content of the soil and the high infusion of chemical fertilizers and insecticides, have taken a heavy toll. Many Paniya and Kuruma men and women have complained that these chemicals are directly polluting their drinking water sources. Another very important social and economic repercussion is the loss of employment opportunities of Paniya women, which has forced them to go in search of jobs even to remote places like Coorg, where they often get exploited by contractors. There is a clear need for a more rational and sustainable management of remaining paddy fields in the district, not merely because the production of the staple food of populace is affected, but also because its preservation is inextricable linked to the food supply chain. The availability of greens, fish and crabs and a host of other locally important products and benefits depend on the paddy fields remaining intact.

Over application of chemicals

Studies have shown that the unscientific application of chemical pesticides/weedicides/fertilizers etc. in the coffee, tea, cardamom and banana plantations, have considerably reduced the population of common edible greens and mushrooms. Paniya women of Mutharikkunnu cited a recent incident where five members of a family had to be hospitalised after consuming greens collected from a banana plantation sprayed with toxic pesticides. The feeling that wild greens may not be safe any more has also reduced its consumption according to these women.

Invasion of alien species

All open clearings like waysides, grazing lands, new plantations and the fallow paddy fields are the usual sites for green leaves collection. A variety of alien species that have appeared suddenly and are getting naturalized rapidly now throng these locations. The climate of the district is highly suitable for the fast growth of many of these exotic species. Some of these have replaced the edible greens; for example species such as *Cassia tora*, *Alternathera sessilis*, *Amaranthus viridis, Amaranthus spinosus, Colocasia esculenta* (Karathalu) etc. are edged out by exotics like *Lantana camera, Parthenium hysterophorus* or *Drymaria cordata* etc. Sizeable areas of Muthanga sanctuary are now infested with *Lantana camera* and *Chromalina odoratum*- two noxious exotics. They now

thrive in the area which has been clear felled of Eucalyptus plantations. Interestingly, the eucalyptus plantation itself came in to being after pristine natural forests were cleared to plant them as part of the social forestry scheme! *Mikania cordata* is another troublesome weed now found in almost all the forest fringes in the district. People describe the unusual way this species choke and destroy the other plants as "Drudharastralinganam", the vicious embrace of the epic character that crushes the unsuspecting opponents to death. *Mucuna pruriense*, *Parthenium hysterophorus, Bidens biternata*, several species of *Blumea* are some of the quick growing alien species which have proliferated in different habitats in the study area.

Interestingly, some of these alien species, as mentioned earlier, are now included in their collection of greens by the Paniya women. *Bidense biternata*- (Alanchappu as the Paniyas have named it) has turned out to be a delicious supplement in their food. This species, found as a weed in plantations, is now sought to be controlled by the planters using strong weedicides! The *Bidens biternata* now flourishes in all the open landscapes, particularly in the human managed ones like the coffee plantations. Among the communities studied only the Paniya women go for this species, but it underscores the fact that the ingenuity of the tribal women is capable of discovering new edible plants to replenish their food basket. It is also an assertion that "traditional knowledge" is dynamic, evolving and ever changing, with both additions and deletions over time.

Chapter 6

Key learnings

Community

1. The larger society is by and large ignorant about the importance of wild food as a cheap and nutritionally rich source of dietary material. The information about the vast variety of wild food is not easily available to the larger society and even the small group of people from the mainstream society who forage the wild for food out of economic deprivation are unaware of much of its nutritional and health significance.
2. The attitudes of communities which traditionally utilised wild plant species as food is rapidly changing -even economically deprived communities like the Paniya- seem to be losing interest in going to the wild to collect plants for food. This is despite several incidents of starvation deaths among the Paniya that are being reported.
3. The reasons commonly cited for this decline of interest and use are:
   - Lack of interest among the younger generation
   - Non-availability of wild food at convenient sites, consequent on drastic changes in the landscape.
   - Restrictions on access
   - Risk of consuming chemically polluted wild foods
   - Lower prestige associated with eating wild foods compared to purchased foods
   - Displacement and/or relocation from their original habitats, leading to alienation and changes in lifestyle

Landscapes

1. The majority of wild foods are collected outside the forest eg. from paddy fields and its fringes and bunds, wayside bushes, agricultural or unmanaged or semi-managed disturbed habitats. These habitats are most vulnerable to the onslaught of a host of developmental activity, including environmentally unsuitable

changes in land use pattern, construction of roads and buildings. Since no designated custodians exist for some of these landscapes, there is a serious lack of commitment for its conservation and sustainable management.

2. A large number of wild greens are getting displaced by aggressive alien invasive species. Their rapid spread creates problems for the survival of native species. The chemical weedicides which have been applied to remove these aggressive exotics from plantations have further endangered the remaining indigenous greens.
3. Different socio-cultural groups/communities have different levels of access and dependency to different landscapes. For example, Paniya depend heavily on disturbed habitats.

Usage

1. Many of the edible greens and other wild species have multiple uses and medicinal value.
2. There are wide differences between the various tribal and non-tribal communities and within communities with regard to usage of wild foods.
3. There are wide differences among the various landscapes in terms of their usage by different groups.

Gender

1. Women shoulder the major responsibility for food security.
2. Women play a key role in the conservation and management of food species.
3. Women are also taking effective steps for the sustainable management of various landscapes and habitats which provide food and medicinal plants.
4. Women play a larger role in wild food collection compared to men unlike in other strategies for food security.
5. Women hold more knowledge than men about the multiple uses of wild plant species.
6. Women's position in the family and community has been adversely affected in the last couple of decades by the impact of various factors, though the present study has not attempted to quantify it. This trend is indicated by evidence such as
   - Decline in levels of nutrition
   - Reduction in dietary diversity
   - Increased burden of work and time taken to access wild foods
   - Fewer opportunities for employment, and
   - Reduced bargaining power within the household.
7. Some of the reasons for this greater inequity in gender relations can be associated with factors such as
   - Declining availability of wild foods leading to its reduced usage and the related erosion in womens' knowledge about wild foods.
   - Shift to cash crops favouring the employment of men to the disadvantage of women.
   - Shift to cash economy where the decision making is tilted in favour of men, leaving women without productive roles.
   - Women hence confined more to the household and non-cash tasks but with continued responsibility for food security.
   - Displacement/relocation of forest communities leading to differential impact on men and women.

Traditional knowledge

1. Traditional knowledge is dynamic and fluid. It is constantly growing as evidenced by the knowledge gained by women within one generation about invasive alien species, especially the wild greens, regarding their habitat, occurrence, food value, edible properties, methods of processing, conservation and other aspects. This is a dramatic illustration of the constant evolution of TK.
2. At the same time, the erosion of traditional knowledge continues, accentuated not just by rapidly changing attitudes but more importantly

by the non-availability, non-accessibility and non-use of several varieties of wild food.

3. There is evidence that some tribal languages/dialects are losing currency at an alarming rate, since the tribals are forced to incresingly negotiate with the outside world and that too in the language of the mainstream communities. This is impacting on the survivial of TK, since many of the terms used to describe wild species are becoming less well-known and/or are going out of usage.

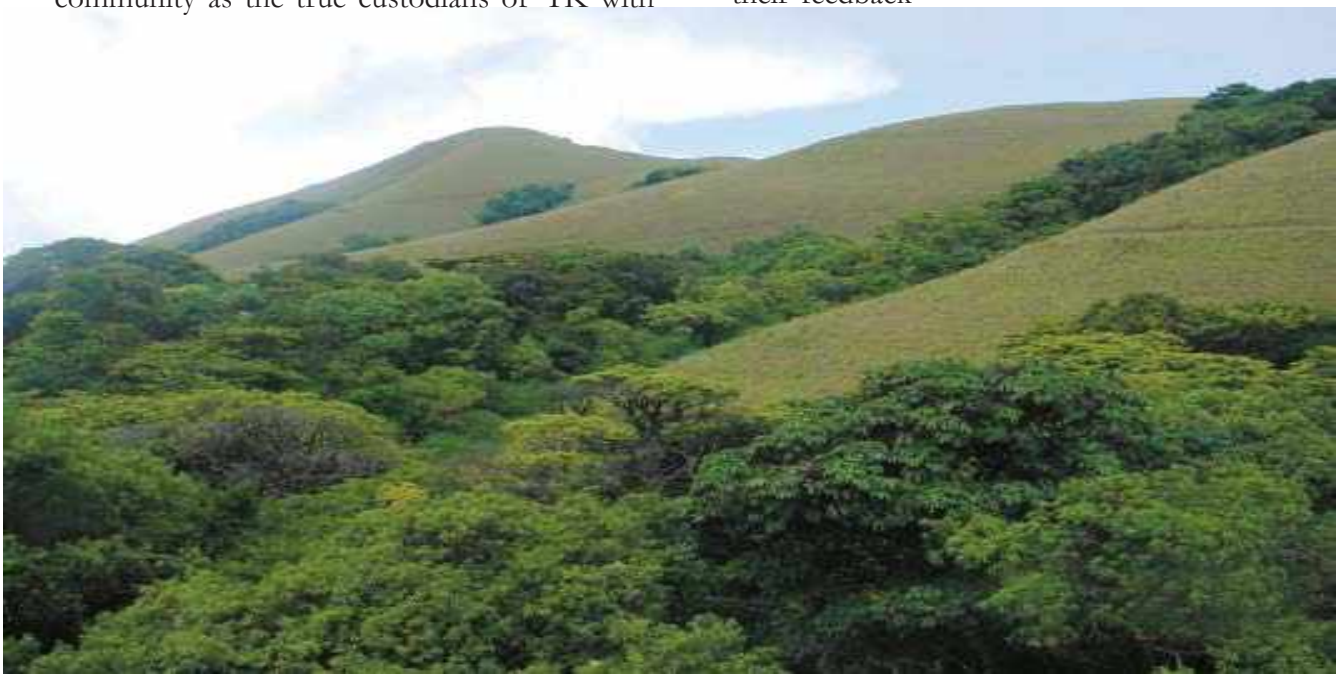
Methodology

1. Integration of expertise in disciplines like social anthropology, field botany and gender studies is a prerequisite for meaningful study of wild foods and their management. Only a balanced contribution from all three disciplines will lead to a holistic understanding of wild resources.
2. The knowledge documented from any community should be given back to them in user-friendly printed, audio or video form so as to enable them to appreciate the depth and variety of their own knowledge.
3. Documentation of TK requires great care and sensitivity as well as an unflinching commitment to recognise the knowledge holders from the community as the true custodians of TK with its attendant rights and protection against abuse or exploitative usage.
4 As the study deals with a sensitive topic like bio-diversity involving detailed documentation, all efforts should be made to ensure that the indigenous and local community's inherent rights are not short-changed. The 'Pattuvam Declaration', that coincided with the compiling of the world's first village bio-diversity registry of Pattuvam village in the Kannur district of Kerala contains enough pointers in this regard.

Recommendations

Based on the findings and insights of the study we have chosen to recommend the following:

1. Areas for future research studies to be taken up are;
   a) Taxonomical, Ethno-taxonomical study and nutritional analysis of edible Mushrooms of Wayanad
   b) Preparation of data base on wild edible plants
2. Preparation of action plan, programmatic interventions and policy advocacy efforts based on people's needs and perceptions after sharing the findings with the community and eliciting their feedback



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ANNEXURES

1. List of wild edible species

Leafy greens

Sl. No.	Local name	Botanical name	Socio-cultural groups
1	Alanchappu	*Bidens biternata* (Lour.) Merr.	P, Ku, K ,O
2	Aliyanchappu	*Zehneria maysorensis* (Wt.& Arn.)Am.	P, Ku, K
3	Ambal	*Nymphaea nouchali* Burm.f.	P, Ku, K
4	Attanga	*Cucumis porphetarum* L.	P, Ku, K
5	Ayanichakka	*Artocarpus hirsutus* Lamk.	P, Ku, K,O
6	Brahmichappu	*Bacopa monnieri* (L.) Pennell	P, Ku, K
7	Chakka	*Artocarpus heterophyllus* Lamk.	P, Ku, K,O
8	Cheenaparangi	*Capsicum anuam* L.	P, Ku, K,O
9	Cheriyakadaaldi	*Cyathula prostrata* (L.) Bl.	P, Ku, K,O
10	Cherucheera	*Alternanthera bettzickiana*.Br.	P, Ku, K,O
11	Cherukadaladi	*Cyathula prostrata* L.	P, Ku, K,O
12	Chooral	*Dendrocalamus strictus* (Roxb.) Nees	P, Ku, K
13	Choracheera	*Alternanthera dentate* Br.	P, K,O
14	Chorakam	*Polygonum chinense* L.	P, Ku, K
15	Choriyanam	*Laportea interrupta* (L.) Chew.	P, Ku, K,O
16	Chorkam	*Polygonum glabrum* L.	P, Ku, K
17	Churuli	*Diplazium esculentum* (Retz.) Sw.	P, Ku, K,O
18	Eenthukumpu	*Cycas circinalis* L.	P, Ku, K,O
19	Hattakkeerai	*Justicia nilgherrensis* (Nees) T.Anders.	P, Ku, K
20	Hinnisan kaya	*Tamilnadia uliginosa* (Retz.) Tirveng.	P, Ku, K
21	Kadambu	*Barringtonia racemosa* Bl.	P, Ku, K
22	Kadukucheera	*Blumea barbata* DC.	P, Ku, K,O
23	Kaida	*Pandanus fascicularis* Lamk.	P, Ku, K
24	Kalicheera	*Amaranthus viridis* var.	P, Ku, O
25	Kannisoppu	*Commeliina bengalensis* L.	P, Ku, K
26	Kara	*Catunaregam spinosa* (Thunb.) Tir.	P, Ku, K
27	Karimthalu	*Colocasia esculenta* (L.) Schott	P, Ku, K,O
28	Karinkoovalam	*Monochoria vaginalis* Presl.	P, Ku, K
29	Kattucheera	*Amaranthus caudatus*.L.	P, Ku, K,O
30	Kattueenthu	*Phoenix sylvestris* Roxb.	P, Ku, K

Sl. No.	Local name	Botanical name	Socio-cultural groups
31	Kattukaipaka	*Momordica dioica* Roxb.	P, Ku, K,O
32	Kattumandaram	*Bauhinia purpurea* L.	P, Ku, K
33	Kattumudunga	*Lycianthes laevis* (Dunal) Bitter	P, Ku, K
34	Kattupaval	*Momordica subangulata* Bl.	P, Ku, K
35	Kattupayar	*Canavalia cathartica* Thours.	P, Ku, K
36	Kattupayar	*Mucuna monosperma* DC.	P, Ku, K
37	Kattuthakkali	*Passiflora calcarata* Mast.	P, Ku, K,O
38	Kattuvenda	*Abelmoschus angulosus* Wall.	P, Ku, K,O
39	Kayalkkalli	*Bambusa arundinacea* Willd.	P, Ku, K,O
40	Kayamachapu	-	P, Ku, K,O
41	Keezharnelli	*Phyllanthus niruri* L.	P, Ku, K,O
42	Kollithalu	*Colocasia esculenta* (L.) Schott	P, Ku, K,O
43	Komaransoppu	-	P, Ku, K
44	Koombichapu	*Adenia hondala* (Gaertn.) de Wilde.	P, Ku, K
45	Koovilisoppu	*Crotalaria laevigata* Lam.	P, Ku, K
46	Kozhimullan	*Hygrophila schulli* Ham.	P, Ku, K,O
47	Kozhivalan	*Achyranthes bidentata* Bl.	P, Ku, K
48	Kozhuppacheera	*Portulaca oleracea* L.	P, Ku, K
49	Kumbil	*Gmelina arborea* Roxb.	P, Ku, K
50	Kundimaruma	*Sonerila rheedei* Wt.	P, Ku, K
51	Kuniyanchappu	*Diplocyclos palmatus* (L.) Jeffrey	P, Ku, K
52	Kunni	*Abrus precatorius* L.	P, Ku, K
53	Kuppacheera	*Amaranthus viridis* L.	P, Ku, K,O
54	Malampuli	*Begonia malabarica* Lamk.	P, Ku, K,O
55	Malampuli	*Begonia integrifolia* Dalz.	P, Ku, K
56	Malampunna	*Dillenia indica* L.	P, Ku, K
57	Malanchuruli	*Dryopteris coculata*	P, Ku, K
58	Malankkeerai	-	P, Ku, K
59	Mancheera	-	P, Ku, K
60	Maracheera	*Waltheria indica* L.	P, Ku, K
61	Marachembu	*Remusatia vivipara* Schott.	P, Ku, K
62	Maradasoppu	*Capparis* sp.	P, Ku, K
63	Marakkeera	*Embelia tsjeriam-cottam* A.DC.	P, Ku, K
64	Minnamkkanni	*Alternanthera pungens* Kunth	P, Ku, K

Annexure - 1

Sl. No.	Local name	Botanical name	Socio-cultural groups
65	Minugalasoppu	-	P, Ku, K
66	Motampuli	*Physalis minima* L.	P, Ku, K
67	Mudungachappu	*Solanum nigrum* L.	P, Ku, K,O
68	Mukkapeera	*Mukia maderaspatana* (L.) M. Roem.	P, Ku, K
69	Mullancheera	*Amaranthus spinosus* L.	P, Ku, K,O
70	Mullancheera Chuvappu	*Amaranthus spinosus* L.	P, Ku, K,O
71	Murikkinchappu	*Erythrina stricta* Roxb.	P, Ku, K,O
72	Muthilila	*Centella asiatica* (L.) Urban	P, Ku, K,O
73	Muyalcheviyan	*Emilia sonchifolia* (L.) DC.	P, Ku, K
74	Naikkadugu	*Cleome viscosa* L.	P, Ku, K
75	Nakkuneeti	*Ophioglossum reticulatum* L.	P, Ku, K
76	Njetipanakumpu	*Arenga wightii* Griff.	P, Ku, K
77	Noolithali	*Antidesma acidum* Retz.	P, Ku, K
78	Palancheera	*Ceropegia stocksii* Hook.	P, Ku, K,O
79	Palankeera	*Ceropegia metziana* Miq.	P, Ku, K
80	Palcheera	*Euphorbia hirta* L.	P, Ku, K
81	Panamchapu	*Caryota urens* L.	P, Ku, K
82	Panchithalu	*Cryptocoryne spiralis* Fisch.	P, Ku, K
83	Panichisoppu	-	P, Ku, K
84	Parachava	*Dryopteris coculata* J.Sm.	P, Ku, K
85	Parippukkeera	*Chenopodium album L.*	P, Ku, K
86	Paruthiyila	*Hibiscus hispidissimus* Griff.	P, Ku, K,O
87	Poninthavara	*Cassia occidentalis* L.	P, Ku, K
88	Ponnamkkanni	*Alternanthera sessilis* R. Br.	P, Ku, K,O
89	Poola	*Bombax ceiba L.*	P, Ku, K,O
90	Poovarasu	*Thespesia populnea* Soland.	P, Ku, K
91	Puliyarila	*Oxalis corniculata* L.	P, Ku, K,O
92	Sambarcheera	*Talinum cuneifolium* Willd.	P, Ku, K,O
93	Thaivasoppu	*Pteridium aquilinum*	P, Ku, K
94	Thavara	*Cassia tora* L.	P, Ku, K,O
95	Thazhuthama	*Boerhaavia diffusa* L.	P, Ku, K,O
96	Thonachisoppu	-	P, Ku, K
97	Unnithandu	*Costus speciosus* (Koen.) Smith	P, Ku, K
98	Valiyakadaladi	*Achyranthes aspera L.*	P, Ku, K,O

Sl. No.	Local name	Botanical name	Socio-cultural groups
99	Vallimaruma	*Cissus discolor* Bl.	P, Ku, K
100	Vasalachapu	*Basala alba* L.	P, Ku, K,O
101	Vattachappu	*Marselia quadrifolia*	P, Ku, K
102	Vayalthalu	*Colocasia esculenta* (L.) Schott.	P, Ku, K,O
Fruits and seeds			
1	Arinjaval	*Syzygium densiflorum* Wall.	P, K
2	Athapala	*Chrysophyllum lanceolatum* Bl. (DC)	P
3	Athypazham	*Ficus racemosa* L.	K, Ku,P,O
4	Ayanichakka	*Artocarpus hirsutus* Lam.	K, Ku, P, O
5	Chadachikkaya	*Grewia tiliaefolia* Vahl.	P, K,O
6	Chakadahannu	*Schefflera oleracea* L.	K
7	Chalir	*Flacourtia montana Grah*.	P, Ku, K,O
8	Chammikkaya	*Aponogeton appendiculatus* Van Brugger	P
9	Chekkipazham	*Ixora coccinea* L.	K, P, K
10	Deprahannu	*Diospyros* sp.	K
11	Eachil	*Aporosa lindleyana* Ball.	P,O
12	Edavahannu	*Leea indica* L.	K
13	Eenthukaya	*Cycas circinalis* L.	P, K,Ku, O
14	Elanchipazham	*Mimusops elengi* L.	P,O
15	Geruhannu	*Buchanania axillaries* (Desv.) Ram	K
16	Hallaekaya	*Grewia* sp.	K
17	Hinnisankaya	-	K
18	Kalanthatta	*Stercula foetida* L.	P,O
19	Kandakarichunda	*Solanum xanthocarpum* Schard.	P, K, Ku,O
20	Karinjavel	*Syzygium gardneri* Thw.	P, K,Ku
21	Karuvachakka	*Solena amplexicaulis* (Lam.) Gandhi	P, K, O
22.	Kattambazham	*Spondias indica* Wt.	P,Ku,O
23	Kattubarli		P,O
24	Kattuchakka	*Artocarpus heterophyllus* Lam.	K, Ku, P, O
25	Kattujadikka	*Myristica malabarica* Lamk.	P,O
26	Kattukariveppu	*Clausena heptaphylla* (Roxb.) Wight	P, K
27	Kattukodampuli	*Garcinia gummigutta* (L.) Robs.	P, K,Ku,O
28	Kattumanga	*Mangifera indica* L.	P, K, Ku,O

Annexure - 1

Sl. No.	Local name	Botanical name	Socio-cultural groups
29	Kattumundhiri	*Rubus fulvus* Focke	P,K,Ku,O
30	Kattunjaval	*Syzygium laetum* Ham.	P, K
31.	Kattuthakkali	*Passiflora calcarata* Mast.	P,O
32	Kirinda	*Scleropyrum pentandrum* (Dennst.) Mabb.	P
33	Kongini	*Lantana camara* L.	P. K
34	Koovalam	*Aegle marmelos,* Corr.	P, O
35	Kottamullu	*Zizyphus jujuba* Lamk.	P,Ku
36	Kottapazham	*Ziziphus oenoplia* (L.) Mill.	P, Ku, K,O
37.	Kottilampazham	*Elaeocarpus tuberculatus* Roxb.	P, K, O
38	Kulayari	*Bambusa arundinaceous* Willd.	P, K, Ku
39	Kurukkanchunda	*Solanum ferox* L.	P, Ku, K, O
40.	Motampuli	*Physalis minima* L.	P, K, Ku, O
41.	Mottilthoory	*Baccaurea courtallensis* Wt.	P
42.	Mudungakaya	*Solanum nigrum* L.	P, Ku, K, O
43	Mukayani	*Bridelia retusa* Spreng	P
44	Mulluvalli	*Toddalia asiatica* (L.) Lamk.	P
45	Neelipazham	*Bischofia javanica* Bl.	P, K
46.	Nelli	*Emblica oficinalis* Gaertn.	K, Ku, P, O
47	Nendravally	*Bridelia scandens* (Roxb.) Willd.	P
48.	Njarapazham	*Syzygium cumini* (L.) Skeels	P, K, Ku, O
49	Njarapazham	*Syzygium caryophyllatum* (L.) Alston	P
50	Njenumkaya	*Gnetum ula* Brogn.	P, O
51	Njotanjodian	*Physalis mouritiana* L.	P,O
52.	Palakkai	*Palaquium ellipticum* (Dalz.) Engl.	P, K, O
53	Panalpazham	*Glycosmis pentaphylla* (Retz.) DC.	P,Ku
54	Pillandi	*Melastoma malabathricum* L.	P,O
55	Pindichakka	*Randia uliginosa* DC.	K, Ku, P
56	Poochapazham	*Syzygium zeylanicum* (L.) DC.	P,O
57	Poodapazham	*Passiflora foetida* L.	P, K, O
58.	Putharichunda	*Solanum torvum* Sw.	P, K, Ku, O
59	Thanikkuru	*Terminalia bellerica* Roxb.	P, O
60	Thodali	*Ziziphus rugosa* Lamk.	P, Ku, K,O
61	Tholnjaval	*Syzygium hemisphericum* Bedd.	P, K,Ku
62	Undanjaval	*Syzygium mundagam* Bourd.	P, K,Ku

Sl. No.	Local name	Botanical name / Landscape	Socio-cultural groups
Tubers			
1.	Noora	*Dioscorea pentaphylla var. pentaphylla*	K
2.	Korana	*Dioscorea pentaphylla var. rheedii*	K
3.	Chenakorana	*D.pentaphylla var.communis*	K
4.	Hendhikorana	*D.pentaphylla* var. *linnaei*	K
5.	Kottunoora	*Dioscorea hispida*	K
6.	Moodavenni	*Dioscorea* sp.	K
7.	Kaluvenni	*Dioscorea hamiltoni*	K
8.	Hekku	*Dioscorea belophylla*	K
9.	Hekkuheruman	*Dioscorea* sp.	K
10.	Heruman	*Dioscorea* sp.	K
11.	Narra	*Dioscorea wallichii*	K
12.	Narramooyan	*Dioscorea* sp.	K
13.	Kavalakalasu	*Dioscorea oppositifolia*	K
14.	Erekalasu	*Dioscorea wightii?*	K
15.	Shoddikalasu	*Dioscorea intermedia*	K
16.	Boojikavala	*Dioscorea pubera*	K
17.	Noora korana	*Dioscorea pentaphylla*	K
18.	Salu	*Dioscorea tomentosa*	K
19.	Nara	*Dioscorea kalkapershadii?*	K
Mushrooms			
1	Nettanavae	Forest floor	K
2	Mavanavae	Dried mango trees	K
3	Huthanavae	Termite pit soil	K
4	Monjanavae	Soil	K
5	Kattanavae	On dried bamboo	K
6	Chulliyanavae	Grasslands	K
7	Maranavae	Dried Trees	K
8	Kozikalanavae	Bamboo forest	K
9	Kachikalanave	Soil	K
10	Chorakalanavae	Riverside, Soil	K

Annexure - 1

Sl. No.	Local name	Landscape	Socio-cultural groups
11	Thorathalanavae	Tree	K
12	Vendageenkananavae	On *Lagestromea* trees	K
13	Jalanave	On *Terminalia* trees	K
14	Komananavae	On *Mangifera* trees	K
15	Uppuhuriyananavae	Forest floor	K
16	Karanavae	Plantations	K
17	Kaykananavae	Plantations	K
18	Therikanavae	Plantations	K
19	Sunkgeenkan	Trees	K
20	Kavananavae	Soil	K
21	Pellikuthananavae	Forest floor	K
22	Njerananavae	On *Syzygium* trees	K
23	Ummananavae	Soil	K
24	Marageenkananavae	Tree	K
25	Penankivi	Soil	K
26	Vellanave	Termite pit soil	K
27	Vendanavae	Forest floor	K
28	Mukkanavae	Plantations	K
29	Kolanavae	Forest floor	K
30	Naymulanavae	Paddy,Grassland	K
32	Kodankimianavae	On dried *Erythrina* bark	K
33	Mayilpeelikumman	Near Bamboo forest	K
34	Mottananavae(karadi)	Forest floor	K
35	Vennanave	Forest floor	K
36	Valanavae	Cow dung	K
Fish			
1.	*Mushu*	Stream, river	P,K,Ku,O
2.	*Kaduve*	Stream, river	P,K,Ku,O
3.	*Parel*	Paddy fields	P,K,Ku,O
4.	*Njenu*	Stream	P
5.	*Kalleppatti*	River	P, K, Ku, O

Sl. No.	Local name	Landscape	Socio-cultural groups
6.	*Koyma*	Stream, river	P, Ku
7.	*Kanneppe*	Stream, river	P, Ku
8.	*Aaral*	Big river	P,K,Ku,O
9.	*Thodameen*	Stream, river	P,K,Ku,O
10.	*Kaichalu*	Big river	P, Ku
11.	*Kalancheppi*	River	P
12.	*Chakkamullan*	River	P,K,Ku,O
13.	*Chempally*	River 9big)	P,K,Ku,O
14.	*Chethil*	River (big)	P,K,Ku,O
15.	*Philoppy*	Paddy fields, stream	P, Ku, O
16.	*Kottavala*	River, stream	P, K, O
17.	*Malanjil*	River	P, K, O
18.	*Thalammakkannan*	Stream	P,K,Ku,O
19.	*Thuppalmkothi*	Streams	P
20.	*Pullipparal*	Streams	P, Ku, O
21.	*Vattapparal*	Streams	P, Ku
22.	*Paralam paral*	Streams	P
23.	*Kakkaparal*	Streams	P, Ku
24.	*Thalavannan paral*	Streams	P,O
25.	*Kammai*	Streams	P
26.	*Kooriparal*	Streams	P,O
27.	*Attuvala*	River	P, K, Ku, O
28.	*Pulvala*	River	P, Ku, O
29.	*Pullumeen*	Streams	P, K, Ku
30.	*Chillumullam*	Streams	P
31.	*Choorikoyma*	Streams	P
32.	*Cheriyakoyma*	Streams	P
33.	*Konchan-red*	Streams	P, K, Ku, O
34.	*Konje*	Streams	P, K, Ku, O
35	*Kumbalappotti*	Stream	P, Ku
36	*Vannal*	Paddy	Ku

P - Paniya K - Kattunaikka Ku - Kuruma H - Hindu M - Muslim Ch - Christian WC - Wayanadan chetty

2. Alien plant species found in different landscape of Wayanad district

Sl. No.	Botanical name	Remarks
1.	*Acanthospermum hispidum* DC.	Native of South America, now a weed in tropical countries
2.	*Bidens biternata* (Lour) Merr. &Scherff	Indo-Malesia to Austrlia and tropical Africa
3.	*Ageratum conyzoides* L.	Native of tropical America, now a common weed in many other tropical countries
4.	*Blumea lacera* (Burm.f.) DC.	Indo-Malesia to Africa and China
5.	*Conyza stricta* Willd.	Indo-Malaysia and Africa
6.	*Crassocephalum crepidioides* (Benth.) S.Moore.	Native of Africa, now Pantropical
7.	*Chromolaena odorata* (L.) King & Robin	Native of tropical America, now a weed in many tropical Asian countries
8.	*Artemesia nilagirica* (C.B.Clarke) Pampan	-
9.	*Mikania cordata* (Burn.f.)Robins	A fast spreading weed in forest plantation and disturbed forest, often smothering the trees, native of tropical Africa
10.	*Parthenium hysterophorus* L.	Native of West Indies, central and North America, naturalised in India. Being highly adaptable, it can flourish where nothing else will grow
11.	*Synedrella nodiflora* (L.) Gaertn.	Native of West Indies
12.	*Spilanthes ciliata* H.B &K.	Native of neo-tropics, now fairly common in Kerala along road sides and marshy places
13.	*Xanthium indicum* Koen.	Indo-Malesia
14.	*Tridax procumbens* L.	Native of Tropical America, now widespread through out tropics and sub-tropics
15.	*Tithonia diversifolia* (Hemsley) A.	Native of Mexico, at places it is an aggressive coloniser
16.	*Wedelia chinensis* Osbeck.	-
17.	*Calapogonium mucunoides* Desv.	Native of Tropical America, introduced as a cover crop in rubber plantations, now spreading to forest and way sides
18.	*Centrosema pubescens* Benth.	Native of tropical America, introduced as a cover crop in plantations, now very widespread in forest and waysides
19.	*Peuraria phaseoloides* (Roxb.) Benth.	Tropical Asia, introduced as a cover crop in rubber plantations and now spreading into forest and way sides
20.	*Mimosa diplotricha* Wright & Sanvalle.	Native of tropical America, now a fast spreading weed in several tropical Asian countries
21.	*Lantana camera* L.	Native of West Indies, now wide spread in several tropical countries
22.	*Aristolochia bracteolata* Lam.	-

3. Glossary of terms

Item	English name	Local name	Socio-cultural groups
Landscapes	Paddy fields	Kandam, Vayal	Kuruma, Paniya, Others
	Marshy land	Aathi, Kolli	Kuruma, Paniya
	Forest	Mala, Kadu	Paniya, Kuruma
	River	Hola, Pozha	Kattunaikka, Paniya
	Streams	Thodu	Paniya
Tools for wild food collection	Tools for fishing	Chada, Kurikka, Meenkurikka, Kortha	Kuruma, Paniya
	Tools for tuber collection	Vathikka, Para	Paniya, Kuruma
	Traps for birds	Kothkeni,Velikeni, Adachakeni,Pakshikeni	Kattunaikka
Household articles	Mortar	Oral, Kunthani	Paniya, Others, Kuruma
	Pestle	Olakka, Thandu	Paniya, Others, Kuruma
	Grinder	Arakkallu, Ammi	Others, Kuruma, Paniya
	Earthen pot	Mankalam, Karimanthalam, Kudukka	Paniya, Kuruma
	Earthen water pots	Paani	Kuruma, Paniya
	Ladle	Kayil, Kava	Paniya
	Bamboo containers		
	for storing milk	Karavala	Kuruma
	for storing MFP's	Chooralkota	Kuruma
	for storing paddy	Thoomba, Komma	Kuruma
Wild food	Leafy vegetable	Soppu, Chappu, Elakari	Kattunaikka, Paniya, Kuruma,
	Mushrooms	Kumman, Anavae, Koonu, Koon	Paniya, Kattunaikka,Kuruma
	Crabs	Nelli, Nendu, Njendu	Kattunaikka, Paniya, Kuruma
	Honey	Jen, Thenu, Then	Kattunaikka, Paniya, Kuruma
	Tuber	Kilangu, Kattukizhangu, Kattukachil	Kattunaikka, Paniya, Kuruma
	Fish	Meenu	Paniya
	Snail	Noonji	Paniya, Kattunaikka, Kuruma
	Fruits	Hannu, Pazham	Paniya, Kattunaikka, Kuruma

4. Details of key knowledge holders

Name	Age in years	Gender	Place
Paniya			
Chunda Amma	73	Female	Kumizhi- Muthanga
Chalan	68	Male	Kumizhi- Muthanga
Ondan	60	Male	Bhappanammala-Ambedkar colony
Gouri	30	Female	Bhappanammala
Cheera	35	Female	Bhappanammala
Vellan	40	Male	Bhappanammala
Channa	65	Female	Kalapurakkal- Puthoorvayal
Gopalan	40	Male	Kalapurakkal- Puthoorvayal
Ammini	40	Female	Kalapurakkal- Puthoorvayal
Kuliyan	47	Male	Kalapurakkal- Puthoorvayal
Manju	13	Female	Kalapurakkal- Puthoorvayal
Vinod	13	male	Kalapurakkal- Puthoorvayal
Gopalan	48	Male	Mutharikkunnu- Pozhuthana
Venu	50	Male	Mutharikkunnu- Pozhuthana
Vellaka	40	Female	Mutharikkunnu- Pozhuthana
Geetha	24	Female	Mutharikkunnu- Pozhuthana
Unni	35	Male	Mutharikkunnu- Pozhuthana
Manoj	7	Male	Mutharikkunnu- Pozhuthana
Umina	7	Female	Mutharikkunnu- Pozhuthana
Anandan	5	Male	Mutharikkunnu- Pozhuthana
Kuruma			
Muthiyamma	70	Female	Puthoorvayal
Parvathi	38	Female	Puthoorvayal
Sasi	35	Male	Puthoorvayal
Madhavi	78	Female	Puthoorvayal
Vasantha	23	Female	Puthoorvayal

Name	Age in years	Gender	Place
Suresh	26	Male	Puthoorvayal
Kunchiraman	55	Male	Puthoorvayal
Lakshmanan	30	Male	Puthoorvayal
Kaveri	52	Female	Puthoorvayal
Ramu	25	Male	Puthoorvayal
Omana	30	Female	Thakarapady- Muthanga
Kavery	50	Female	Thakarapady- Muthanga
Midhun	7	Male	Thakarapady- Muthanga
Usha	26	Female	Thakarapady- Muthanga
Parvathi	55	Female	Thakarapady- Muthanga
Velayuthan	35	Male	Thakarapady- Muthanga
Kartha	60	Female	Thakarapady- Muthanga
Subrahmanyan	42	Male	Thakarapady- Muthanga
Shivan	33	Male	Thakarapady- Muthanga
Anitha	15	Female	Thakarapady- Muthanga
Kattunaikka			
Vasu	30	Male	Ponkuzhy- Muthanga
Kullan	32	Male	Ponkuzhy- Muthanga
Kulli	64	Female	Ponkuzhy- Muthanga
Rugmini	29	Female	Ponkuzhy- Muthanga
Vijayan	35	Male	Ponkuzhy- Muthanga
Prakashan	44	Male	Ponkuzhy- Muthanga
Meenakshi	45	Female	Ponkuzhy- Muthanga
Kesavan	35	Male	Ponkuzhy- Muthanga
Balan	45	Male	Ponkuzhy- Muthanga
Suku	18	Female	Ponkuzhy- Muthanga
Meenakshi	28	Female	Ponkuzhy- Muthanga
Damodaran	50	Male	Aranamala
Sarojam	50	Female	Aranamala

Annexure - 4

Name	Age in years	Gender	Place
Raghavan	25	Male	Aranamala
Ramathai	55	Female	Aranamala
Balan	45	Male	Bhappanammala
Madhavi	70	Female	Bhappanammala
Chandran	30	Male	Bhappanammala
Anitha	27	Female	Bhappanammala
Pushpa	16	Female	Bhappanammala
Others			
Eliyamma	36 Christian	Female	Churalmala
Avarachan	43 ”	Male	Churalmala
Annamma	76 ”	Female	Churalmala
Sevier	79 ”	Male	Churalmala
Jose	20 ”	Male	Churalmala
Kadeeja	70 Muslim	Female	Mutharikkunnu
Aminumma	”	Female	Churalmala
Muhammed	70 ”	Male	Mutharikkunnu
Sheharban	29 ”	Female	Churalmala
Bhava	35 ”	Male	Churalmala
Divakaran	67 Hindu	Male	Aanoth
Bharathiamma	70 ”	Female	Churalmala
Meena	26 ”	Female	Puthurvayal
Ajesh	12 ”	Male	Puthurvayal
Krishnan	24 ”	Male	Puzamudhi
Satheesh	26 Chetty	Male	Thakarappadi
Lakshmi Amma	55 ”	Female	Thakarappadi
K.G.Narayanan	35	Male	Thakarappadi
Divakaran	30	Male	Thakarappadi
Latha	28	Female	Thakarappadi

5. Some commonly used wild edible species

Leafy greens

Alamchappu, Kandonakkuthy, Uthransopu
Bidens biternata
Family : Compositae

Description : An annual, erect, simple or much-branched herb. Leaves bipinnately compound; segments linear to ovate-lanceolate, toothed or lobed. Flowers in heads of 1-1.5 cm diameter, yellow.
Distribution : Almost throughout India. (Alien species)
Propagation : Natural regeneration by seeds.
Parts used : The young shoots are used as vegetable.
Dependent communities : Paniya

Kuppacheera
Amaranthus viridis L.
Family : Amaranthaceae

Description : Erect much-branched, unarmed annual herb. Leaves ovate, rhomboid. Flowers very minute, in spikes, which are panicled.
Flowering & Fruiting : Almost throughout the year
Distribution : Throughout India
Parts used : The leaves and tender shoots as vegetables. Place of collection: Puthoorvayal
Dependent communities : Paniya, Kuruma, Kattunaikka
Landscape : Open areas

Mullan cheera
Amaranthus spinosus Willd.
Family : Amaranthaceae

Description : Erect spinous herb varying in colour from green to red/purple. Leaves usually oval or lanceolate, axils with 5 spines. Flowers unisexual greenish white, in axillary clusters, also in long terminal spikes; seed black, shiny.
Flowering & Fruiting : Almost throughout the year, but mainly from July-December.
Distribution : Throughout India
Parts used : Tender shoots and leaves are used as a vegetable. Young leaves very much relished by the tribes as vegetable cooked with pulses.
Place of collection : Puthoorvayal
Dependent communities: Paniya, Kuruma. Kattunaikka, Settlers

Palancheera
Ceropegia metziana Miq.
Family : Asclepiadaceae

Description : Twiners, stem glabrous, except at nodes, leaves ovate, appressed hairy above, cymes few flowered.
Flowering : Sept- Nov.
Distribution : Endemic to Southern Western Ghats
Parts used : Leaves used as vegetable
Place of collection : Aranamala
Landscape : Evergreen forest
Dependent communities : Kattunaikka

Mudunga chappu, Kattuthakali, Chukkooti
Solanum nigrum L.
Family : Solanaceae

Description : An annual herb. Leaves ovate-oblong. Flowers small in drooping umbels, grayish or white. Fruit globose, purplish-black, shiny when ripe, seeds many, yellow.
Flowering & Fruiting : Almost throughout the year.
Distribution : Throughout India up to an altitude of 2700m.
Propagation : By seeds.
Parts used : Young shoots and leaves are cooked and eaten. Ripe fruits are also eaten; make a delightful jam.
Place of collection : Puthoorvayal
Dependent communities : Paniya, Kuruma, Settlers

Unnithandu
Costus speciosus (Koen.) Smith.
Family : Zingiberaceae

Description : Erect herbaceous plant with fleshy perennial rootstock. Leaves spirally arranged, lanceolate, oblong, pointed. Flowers large, white with a yellow center, in terminal dense heads, Fruit a capsule, seeds black, with white fleshy appendage.
Flowering : July to August.
Distribution : Throughout India up to an altitude of 1350m
Propagation : By stem cutting.
Parts used : Leafy stems made into vegetable and eaten. Tender young shoot, boiled in coconut juice, is said to make a good vegetable. Rhizomatous root- stocks, rich in starch, are used as vegetable and pickled.
Place of collection: Manikkunnumala
Dependent communities: Christians
Landscapes : Evergreen Forest

Kollithalu, Vayalthalu
Colocasia esculenta (L.) Schott
Family : Araceae

Description : Tuberous herb without above-ground stem. Leaves heart-shaped, peltate, petioles up to 2 cm long. Flower in spadix in a 30-40 cm long, yellow.
Flowering : July to September.
Propagation : By tubers and suckers.
Parts used : All parts are edible. The tubers are rich in starch and used like potato. Young leaves and stalks are cooked and used as vegetable and fruits are also edible.
Place of collection : Manivayal
Dependent communities: Paniya, Kuruma, Kattunaikka

Muthilila, Kudangal
Centella asiatica (L) Urban.
Family : Apiaceae

Place of collecti
Description : A prostrate and creeping herb, rooting at nodes; stem slender. Leaves as a cluster from the rootstock, orbicular-reniform. Flowers pink, 3-4 in an umbel, which are fascicled. Fruit ca 4mm long, ovoid.
Flowering & Fruiting : May- November.
Distribution : Almost throughout India usually up to an altitude of 2000m.
Propagation : By the plantlets developed for the rooted branches; also by seeds.
Parts used : Leaves and young parts used as vegetable and for making chutney.
Place of collection : Puthoorvayal
Dependent communities : Hindu, Paniya
Landscape : Paddy fields and Open moist areas

Kattumudunga
Lycianthes laevis Dunal
Family : Solanaceae

Description : Straggling undershrubs, leaves elliptic lanceolate, long acuminate. Berries globose, red when ripe.
Flowering &Fruiting : March- Nov.
Distribution : Suuth India
Parts Used : Leaves used as vegetable
Place of collection : Chooralmala, 900 forest
Landscape : Evergreen forest
Dependent communities : Paniya, Christian

Kumbichappu
Adinia hondala (Gaertn.) de Wilde
Family : Passifloraceae.

Description	:	Climbing shrubs with tendrils. Leaves 16-25 x 8-11cm, shining above, ovate, acuminate at apex slightly cordate at base. Flowers white in axillary cymes. Capsules 3-valued, red.
Distribution	:	Occasional in moist deciduous forests.
Flowering & Fruiting	:	March- August
Parts used	:	Leaves and flowers as vegetable.
Place of collection	:	Vythiri Ghats

Panchithalu
Cryptocoryne retrospiralis Kunth.
Araceae

Description	:	An aquatic herb with vertical or horizontal root stocks, leaves 8-30cm, radical, linear or linear lanceolate.
Distribution	:	Almost throughout India, rare in distribution
Flowering & Fruiting	:	Nov. – Jan.
Parts Used	:	Leaves used as vegetable
Place of collection	:	Attamala
Landscape	:	Riverbeds
Dependent communities	:	Paniya

Nakkuneeti
Ophioglossum reticulatum L.
Family : Ophioglossaceae

Description	:	A small fern with short, cylindrical, fleshy rhizome. Frond ovate; stipe up to 10 cm long, slender, sterile segment ovate; fertile segment linear bearing a 3 cm long terminal spike. Sporangia 15-40 in each row, globose; spores light yellow, oval to round.
Flowering	:	June to August
Distribution	:	Throughout India from the plains to mountainous regions up to an altitude of 1800m, Rare
Parts used	:	Young leaves eaten as vegetable and also as salad.
Place of collection	:	Muthanga Wild Life Sanctuary
Dependent communities	:	Paniya
Landscape	:	Moist Deciduous Forest

Sambar Cheera
Trianthema portulacastrum L.
Family :Aizoaceae

Description	:	A prostrate sub-succulent annual; stem often purplish-tinged. Leaves unequally paired, broadly obovate. Flowers solitary, axillary, small, pink. Fruit a capsule.
Flowering& Fruiting	:	June- August
Distribution	:	Almost throughout India
Propagation	:	Mainly by seeds; can also be done by cuttings.
Parts used	:	Whole plant is used as vegetable
Place of collection	:	Pulpally

Palcheera
Euphorbia hirta L.
Family : Euphorbiaceae

Description	:	An erect or ascending annual herb, with milky juice. Leaves opposite. Flowers naked, borne in a cup. Fruit is a capsule, hairy, 3-seeds.
Flowering	:	Throughout the year
Distribution	:	Common in waste ground throughout the hotter parts of India; usually up to an altitude of 1200m.
Parts used	:	Tender shoots and leaves have served as a famine food; they may be eaten cooked in very small quantities.
Place of collection	:	Meppadi
Dependent communities:		Paniya

Kannisoppu
Commelina benghalensis L.
Family : Commelinaceae.

Description	:	Herbs, 60-90 cm high. Leaves ovate or oblong. Flowers blue or bluish violet, 2-3 together. Fruit a capsule, pear shaped, mostly 5- seeded.
Flowering	:	July- November.
Fruiting	:	July- November.
Distribution	:	Throughout India in moist regions up to an altitude of 2000 m.
Propagation	:	Mainly by stem cuttings, also by seeds.
Parts used	:	Tender shoots are eaten as vegetable after cooking.
Place of collection	:	Muthanga

Thakatasopu, Thavara
Cassia tora L.
Family : Caesalpiniaceae

Description	:	Herbaceous annual, leaves compound with 3 pairs of leaflets. Flowers yellow, in pairs or slitary. Fruit a pod, cylindrical to 4-angled, seeds numerous, subcylindric to rhomboidal, brown.
Flowering	:	September-October.
Fruiting	:	November-December.
Distribution	:	Throughout India.
Parts used	:	Young fruit are used as a vegetable. Also young leaves and twigs are cooked and eaten as vegetable. Mature seeds are boiled with tea as an ingredient and consumed to keep the body warm in winter
Place of collection	:	Puthoorvayal

Ponnamkanny
Alternanthera sessilis R. Br.
Family : Amaranthaceae

Description	:	Erect or ascending or prostrat herb rooting at the nodes. Leaves sessile or shortly petioled. Heads solitary or few, axillary, white. Fruit compressed, with thickened margins, brown.
Flowering & Fruiting	:	Almost through out the year.
Distribution	:	Throughout India.
Propagation	:	By rooted stem cuttings; also by seeds.
Parts used	:	Tender shoots and leaves are eaten as vegetable; also eaten with fish or rice. Young shoots are nutritious.
Place of collection	:	Puthoorvayal

Marumachappu
Cissus repens Lamk
Family : Vitaceae.

Description	:	A weak succulent trailer, stem glaucous white when young; tendrils forked. Leaves broadly ovate, deeply cordate, margins undulate and distantly toothed. Flowers small, greenish white, in compound umbellate cymes. Fruit a berry, subglobose, black when ripe, 1- seeded.
Flowering	:	July- September.
Fruiting	:	November- December.
Distribution	:	Natural regeneration by seeds and by severed branches.
Parts used	:	The succulent young shoots are edible and pleasantly acid in taste; used as substitute for tamarind.
Place of collection	:	Sugandhagiri

Karinkoovalam
Monochoria vaginalis Presl
Family : Pontederiaceae.

Description	:	Erect herbs up to 45cm tall. Ovate or Sub-reniform acuminate, base rounded or cordate. Flowers blue, in axillary racemes. Capsules oblong, glabrous.
Flowering	:	November- December.
Distribution	:	Common weed in rice fields and other wet lowlands in plains and hills.
Medicinal Uses	:	Root: Chewed to relieve toothache. Bark: eaten with sugar to relieve asthma.
Parts used	:	Leaves used as vegetable.
Place of collection	:	Chooralmala

Kozuppacheera
Portulaca oleracea L.
Family : Portulacaceae.

Description	:	A fleshy annual herb, with prostrate stems up to 50 cm long. Leaves variable, oblong,. Flowers bright yellow, solitary or in clusters. Fruit an ovoid capsule; seeds black,
Flowering & Fruiting	:	Rainy season.
Distribution	:	Throughout India.
Parts used	:	The leaves and young shoots are used as vegetable; young shoots also makes excellent salad. Fleshy stems are pickled; they are also dried and preserved for use in times of scarcity.
Place of collection	:	Pozhuthana
Dependent communities	:	Paniya
Landscape	:	Open areas

Kozhimullan
Hygrophila erecta (Burm.f.) Hochr.
Family : Acanthaceae

Description	:	An erect or ascending herb. Leaves linear or linear-lanceolate. Flowers pale purple, in axillary clusters. Fruit a capsule, linear, 20-30 seeds.
Flowering	:	August- October
Fruiting	:	October- December.
Distribution	:	Mainly in southern India.
Propagation	:	By seeds.
Parts used	:	Young leaves are used as vegetable by Paniya tribes
Place of collection	:	Muthanga

Naikkadugu
Cleome viscosa L.
Family : Capparidaceae

escription : A fle
Description : Annual herb, 10-60 cm or occasionally 1 m high. Leaves with 3-5 leaflets. Flowers yellow in racemes. Fruit long beaked, seeds roundish, black.
Flowering & Fruiting : Rainy season.
Distribution : Throughout India.
Propagation : By seeds.
Parts used : Plant is used as vegetable after cooking
Place of collection : Puthoorvayal

Maracheera
Embelia tsjeriam-cottam A.DC.
Family : Myrsinaceae

Description : Large shrubs to small trees, leaves glabrous, elliptic obovate, slightly dentate, racemes nearly glabrous. Flowers greenish white and red berries.
Distribution : Western Ghats
Flowering & Fruiting : July- September
Parts Used : Leaves and young shoots used as vegetable.
Place of collection : Muthanga

Maracheera
Waltheria indica L
Sterculiaceae

Description : Large herbs with woody stem, leaves ovate, serrate, flowers yellow in globose axillary clusters.
Distribution : Throughout India
Parts Used : Young shoots used as vegetables
Flowering & Fruiting : Sept. – March
Landscape : Common in waste places and in forest undergrowth
Dependent communities : Paniya

Churulichappu
Diplazium esculentum (Retz.) SW.
Dryopteridaceae

Description : A medium sized fern having stout stem, usually unbranched
Distribution : A very wide spread fern occurring all over in the plain and up to 1000 m altitude, growing in open moist to swampy localities, usually close to permanent water sources, often forming extensive colonies.
Place of collection : Puthoorvayal
Landscape : Swampy localities
Dependent communities : Paniya, Kattunaikka

Fruits & Seeds

Njettipana
Arenga wightii Griff.
Family: Arecaceae

Description : A palm, 8-15m high, Leaves pinnate, 6-8.5m long, 1-2.5 m wide, with up to 115 pairs soft leaflets. Inflorescence 3 m long from axils of top leaves. Fruit a nut, numerous, about 5-6 cm long, oblong, yellow when ripe.
Flowering : February - October.
Distribution & status : Occurs wild in Western Ghats, Occasional
Propagation : By means of seeds and suckers.
Parts used : The tender leaves and sweet pith are eaten. The buds are eaten raw as an excellent salad or cooked as vegetables. The fleshy kernels of the young fruits are cooked and eaten.
Place of collection : Vythiri forest
Dependent communities : Paniya
Landscape : Evergreen Forest

Kattu Kodampuli
Garcinia gummigutta Choisy
Family :Clusiaceae

Description : An evergreen tree with drooping branches. Leaves ovate, oblong, lanceolate, dark green above and pale beneath. Fruit globose, dark purple when ripe, 5-8-seeded.
Flowering : April- June.
Fruiting : June- August.
Distribution : Tropical rain forest of Western Ghats from Konkan southward, Karnataka, Coorg and Wayanad; also in Maharashtra.
Propagation : By seed.
Parts used : The fruit has a pleasant flavor and a sweetish taste and is used in curries.
Place of collection : Chooralmala
Dependent communities : All the Socio-cultural Groups

Kuriyankaya
Diplocyclos palmatus (H.) Jeffrey.
Family : Cucurbitaceae

Description : An annual climbing herb, leaves lobed with tendrils, fruits globose with white lines, red when rope.
Distribution : Throughout India
Flowering & Fruiting : September - March.
Parts used : Fruits used as vegetable and need thorough processing before use.
Place of collection : Attamala

Chammikkaya
Aponogeton appendiculatus
Family : Aponogetonaceae

Description	:	Aquatic tuberous herbs. Submerged leaves linear-lanceolate, floating leaves with usually cordate base. Spikes 3-7 cm long, dense flowered, in 15-40 cm long peduncle. Flowers white.
Flowering & Fruiting	:	Throughout the year.
Distribution	:	Endemic to Kerala, endangered
Propagation	:	By tubers.
Parts Used	:	Fruits and tubers are edible; considered to be as good as potatoes.
Place of collection	:	Banasurasagar dam site

Chaliru
Flacourtia indica (Burm.f.) Merr.
Family : Flacourtiaceae

Description	:	A small tree up to 6m high with axillary thorns. Leaves variable in shape, 2-9 x 2-5 cm. Flowers greenish yellow, unisexual. Fruit globose, red or dark purple when ripe, 8-16 seeded.
Flowering	:	February- March.
Fruiting	:	April- June.
Distribution	:	Throughout India up to 1700m altitude, occasional
Propagation	:	By means of seeds.
Parts used	:	The fruit has sweetish taste and eaten raw or cooked; leaves are also eaten, rich in pectin and sufficiently acidic and good for jams and jellies.
Place of collection	:	Manikkunnumala
Dependent communities	:	Paniya
Landscape	:	Semi Evergreen Forest

Kattupayar
Vigna vexillata (L.) A. Rich
Family : Fabaceae

Description	:	A slender perennial twiner with tuberous roots. Leaves 3-foliolate. Flowers large, purple, in 2-4 flowered head-like raceme. Fruit a pod, straight, 15-20-seeded.
Flowering& Fruiting	:	September- October.
Distribution	:	Almost throughout the tropical part of India and ascending up to 2000 m
Propagation	:	By seeds.
Parts used	:	Fruits eaten as vegetable.
Place of collection	:	Chembra hills
Dependent communities	:	Paniya
Landscape	:	Grasslands

Eenthukaya
Cycas circinalis L
Cycadaceae

Description : A deciduous tree, 10 m high, leaves pinnate, 2-3 m long, leaflets 60 to 100 pairs, seeds oval-shaped, orange red.
Flowering &Fruiting : May-July
Distribution : Occurs wild in the hills of South India and Orissa
Parts Used : Sago is extracted from the trunk of 6 to 7 years old plant.
Localities : Plantations and Semi-evergreen forest
Place of collection : Suchipara
Dependent Communities: Hindu & Muslim

Kalanthatta
Sterculia villosa Roxb.
Family : Sterculiaceae.

Description : A medium to large tree with spreading crown. Leaves deeply 5-7-lobed; lobes again lobed or entire. Flowers yellowish with pink center, in 20-30 cm long pendulous rusty-pubescent panicle. Follicles (fruit) 2-5, spreading, oblong, seeds black, shining.
Flowering : January-March
Fruiting : May-June.
Distribution : In the semi evergreen forests throughout the greater parts of India,
Propagation : Natural regeneration by seeds; artificially seedlings are raised in nurseries and transplanted, also by stump planting
Parts used : The seeds are eaten cooked or roasted
Place of collection : Vythiri Ghats

Mottampuli
Physalis minima L.
Family : Solanaceae

Description : An annual herb, 20-30 cm high. Leaves ovate. Flowers pale yellow, solitary. Fruit a berry, globose, many-seeded, enclosed in the enlarged membranous calyx.
Flowering &Fruiting : August- December.
Distribution : Through out India.
Propagation : By seeds.
Parts used : The ripe fruits are edible. Leaves and tender stems are cooked as vegetable.
Place of collection : Puthoorvayal
Dependent communities: Paniya, Kattunaikka, Settlers
Landscapes : Open areas

Pindichakka
Catunaregam uliginosa (Retz.) Sivar.
Family : Rubiaceae

Description	:	A deciduous tree, up to 7m high with reddish brown scaly bark. Leaves obovate. Flowers white, fragrant. Fruit a berry 5-6 cm long, ellipsoid or ovoid, yellowish brown when ripe with persistent calyx; seeds 12, embedded in pulp.
Flowering	:	April-May.
Fruiting	:	May-June.
Distribution	:	Central and southern India, Rare
Propagation	:	By seed and suckers also.
Parts used	:	The ripe fruits are eaten boiled or roasted and also used in curries.
Place of collection	:	Muthanga

Kattuthakkali
Passiflora calcarata Mast.
Family : Passifloraceae.

Description	:	Large climers, leaves lobed, coriaceous. Flowers white and fruit yellowish.
Distribution	:	Through out India (Madagascar species)
Flowering & Fruiting	:	March- April.
Parts Used	:	Fruits and flowers used as vegetables.
Place of collection	:	Sugandhagiri

Kattukaipaka
Momordica subangulata Bl.
Family : Cucurbitaceae.

Description	:	A pretty climber with large yellowish flowers, petals conspicuously veined.
Distribution	:	Western Ghats from south Canara to Wayanad, Rare.
Flowering & Fruiting	:	October- December
Parts used	:	Fruits used as vegetable.
Place of collection	:	Pozhuthana

Mootipazham
Baccaurea courtallensis Muell. Ar.
Family : Euphorbiaceae

Description	:	A moderate-sized evergreen tree. Leaves oblanceolate. Flowers in long racemose spikes which covers most part of the trunk and substantial part of the branches, reddish. Fruit crimson.
Flowering	:	February- March
Distribution	:	From South Kanara southwards to South Kerala and the adjoining Western parts of Tamil Nadu in evergreen forests up to an altitude of 900m.
Propagation	:	By seeds.
Part used	:	Fruits are acidic and edible
Place of collection	:	Vythiri Ghats

Tubers

Shoddikkalasu
Dioscorea intermedia

Dependent community: Kattunaikka
Habit: Tuberous Climbers
Habitat: Dry Deciduous Forest
Distribution: Endemic to Southern Western Ghats
Flowering & Fruiting: August to February
Place of collection: Muthanga

Hendikorana
Dioscorea pentaphylla var. linnaei

Dependent Community: Kattunaikka
Habit: Tuberous Climbers
Habitat: Moist Deciduous Forest
Distribution: Endemic to Southern Western Ghats
Flowering & Fruiting: November- February

Narakkalasu
Dioscorea kalkapershadii

Dependent Community: Kattunaikka
Habit: Tuberous Climbers
Habitat: Plantations and Wayside
Distribution: Endemic to Southern Western Ghats
Flowering & Fruiting: August- December

Erakalasu
Dioscorea wightii

Dependent Community: Kattunaikka
Habit: Tuberous Climbers
Habitat: Rocky Grass Lands
Distribution: Endemic to Southern Western Ghats
Flowering & Fruiting: November- February

Hekkukalasu
Dioscorea belophylla

Dependent Community: Kattunaikka
Habit : Tuberous Climbers
Habitat : Moist Deciduous Forest
Distribution : Endemic to Southern Western Ghats
Flowering & Fruiting : August- December

Mushrooms

Jalanavae

Dependent community : Kattunaikka
Habitat : Near jal (*Dalbergia latifolia*) trees
Colour : White
Season : Through out Monsoon
Place of collection : Muthanga

Chorakalanavae

Dependent Community : Kattunaikka
Habitat : Riverside soil in groups
Colour : Dark yellow
Season : North East Monsoon
Place of collection : Muthanga

Huthanavae/Puttukkumman

Used community : Kattunaikka, Paniya, Kuruma, Others
Habitat : Near termite pits (Puttu) in plantations
Colour : Milky white in colour
Season : Through out Monsoon
Place of collection : Puthoorvayal

Maranavae

Dependent Community : Kattunaikka
Habitat : On the bark of trees (*Mangifera indica* & *Syzygium cumini* etc)
Colour : Pinkish white
Season : South West Monsoon
Place of collection : Puthoorvayal

Hanikanave/ Kozhikkalukkumman

Dependent Communities : Kattunaikka, Paniya
Habitat : Bamboo forest
Colour : Cream yellow
Season : South West Monsoon
Place of collection : Muthanga

Kolanavae/Kadupodian/Arikkoon

Dependent Communities : Kattunaikka, Kuruma, Paniya, Others
Habitat : Plantations in groups
Colour : White
Season : Through out Monsoon
Place of collection : Muthanga

Vennajalanavae

Dependent Community : Kattunaikka
Habitat : Near jal (*Dalbergia latifolia*) trees
Colour : Pink and white
Season : South West Monsoon
Place of collection : Muthanga

Nettanavae/Njakkoon

Dependent Communities : Kattunaikka, Kuruma
Habitat : Plantations
Colour : White & Light Brown
Season : South West Monsoon
Place of collection : Muthanga, Puthoorvayal

Kathukumman/CheviKumman

Dependent Community : Paniya
Habitat : On the dried bark of Murikku (*Erithrina indica).*
Colour : Brown
Season : Monsoon season
Place of collection : Mutharikkunu

Uppuhuriyananavae

Dependent communities : Kattunaikka
Habitat : Bamboo forest in groups
Colour : White & brown
Place of collection : Muthanga
Season : South West Monsoon