

Gendered knowledge and changing trends in utilization of wild edible greens in Western Ghats, India

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The paper describes the differences and trends in the use and management of wild edible greens within and between households pertaining to three ethnic and one migrant community in Wayanad district, an agro-biodiversity hot spot in southern Western Ghats. A total of 366 people were interviewed and 20 key informants were selected from each community to examine multiple uses, preferences, marketing and local availability of edible wild greens, where 102 species were recorded. The paper discusses how gender, ethnicity, age and socio-economic status affect wild green management and household nutritional security. Women are more skillful in managing the surrounding landscape and are main knowledge holders and conservationists. The implications of land use changes, agrochemicals, restrictions on forest access and alien species invasion on the availability of wild greens are highlighted. It was found that women are taking effective steps to sustainably manage landscapes and species that provide edible greens, but changing trends in gender relations inhibit their efforts; alien species invasion and modern agri-practices lead to local extinction of many greens, and the erosion of traditional knowledge especially among youth due to materialistic life style affects the sustainable use of many wild greens.

Key words: Wild edible greens, Traditional knowledge, Ethnicity, Nutritional security, Biodiversity conservation, Western Ghats, *Paniyar* tribe, *Kattunaikkar* tribe, *Kurumar* tribe

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The role of gender in enhancing food security has been a major topic of discussion in recent years¹⁻⁴. 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 wilderness⁵⁻⁹. Gender research shows a majority of plant species and varieties used for food and medicine are conserved and managed at household level by women¹⁰⁻¹¹. Women of most tribal communities feed their families with food from the forest or the nearby wilderness in many parts of the tropical world. 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* (conservation, management and improvement of genetic resources for food and agriculture. The decision of what to conserve depends on the know-how and perception of what is most useful to the household and local community. The

consumption of wild plants seems more common and widespread in food insecure areas, where a diverse kind of species is consumed^{9,10,12-15}. The paper gives information of the management of edible leafy greens by four different socio-cultural groups- three tribal communities and a heterogeneous non-tribal group from Wayanad district- a biodiversity hot spot in Western Ghats¹⁶. The knowledge and skills of these communities in managing various wild edible greens is discussed. Information on the location and landscapes, where such species are seen also is provided. The paper discusses in particular how the gender relations and role differences among these communities affect the management of such diversity and nutritional security at the household level.

Wayanad is a hilly terrain in southern Western Ghats and lies at an altitude of 750 m above sea level (Fig. 1). Forest types of tropical wet evergreen, semi-evergreen, dry evergreen, moist deciduous and dry deciduous are seen in this district. The biodiversity of this place is very diverse at all levels-habitat, species and genetic, and with an impressive rate of endemism in flowering plants group. Flowering plants include several Red Data Book species like *Ipsea malabarica* (Reichb.f.) Hook. f., *Hedyotis wayanadensis*

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Fig.1 Location map of Wayanad district

(Gamble) Rao & Hemadri, *Cynometra bourdilloni* Gamble, 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 used in the Indigenous Systems of Medicine are known from the district¹⁷. A number of cultivated food plants have their wild relatives like *Vigna vexillata* (L.) A. Rich. var. *sepiaria* (Dalz) Babu & Sharma, *Artocarpus heterophyllus* Lam., *Dioscorea oppositifolia* L., etc. present in the district. 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.

In a broad sweep classification limited to the purpose of the study, Wayanad district has been broadly divided into two ecological zones - Wet & Dry, based on rainfall, climate and vegetation. The district has a wide variation of climate and season and receives abundant rainfall (ca.3 cm). 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. High velocity winds are common during the Southwest monsoon while dry winds blow in March-April. High altitude regions are comparatively cooler climate while the mean maximum temperature is 29°C and minimum 18°C.

Methodology

The study began in June 2001 was completed in three phases; The first phase, lasting about two months focused 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 finalized through discussions with ethnobotanists and social scientists. Subsequently, a pilot study was conducted at field level to test the reliability and validity of methodology followed in the study. The second phase of the study involved extensive field survey and data collection from August 2001 to July 2003 that has resulted in the information about all wild edible species and materials of Wayanad district. The final phase of approximately two months was spent in analyzing the information and validating and exchanging the study findings with key knowledge holders from the communities through feedback meetings. Five study sites were selected at random using a grid map of the Wayanad district and preference had been given to

wet area because of the greater concentration of tribal communities and its richness in terms of bioresources compared to the other region. Fifteen tribal hamlets from these five sites were randomly selected on the basis of degree of traditionalism of people, vegetation type of the area and dependency of local people on forest and natural resources (Table 1). A total of 366 knowledge holders of different age groups from four different socio-cultural groups were selected randomly from these hamlets and interviewed (Table 2). Data enumerate and categorize the 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 interviews using unstructured questionnaire with open-ended questions and discussions were

carried out. 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. 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 the 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 features, seasonality as well as abundance

Table 1—Profile of the study sites

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

Table 2—Total Number of Informants

Site	Informants- Age wise											
	Paniya			Kattunaikka			Kuruma			Others		
	*C	*A	*O	C	A	O	C	A	O	C	A	O
<i>Puthoorvayal</i>	12	8	9	-	-	-	10	15	12	10	10	10
<i>Muthanga</i>	9	6	7	12	15	16	10	12	12	5	6	7
<i>Banasuramala</i>	8	7	9	8	7	8	—	—	—	—	—	—
<i>Pozhuthana</i>	12	8	15	—	—	—	—	—	—	4	5	5
<i>Chooralmala</i>	—	—	—	—	—	—	—	—	—	12	8	12
<i>Attamala</i>	—	4	6	—	—	—	—	—	—	—	—	—
<i>Aranamala</i>	—	—	—	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

and rarity according to locations and seasons were recorded. 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. 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 km of the habitations, where these group regularly access in all the 15 locations. Specimens were collected for both herbarium and *ex-situ* germplasm preservation. Detailed information about the availability of different wild greens, 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 hamlet and through in-depth interviews with 20 to 25 key knowledge holders, which were identified based on their response and quantity of information given during the initial visits, from each socio-cultural group.

The study sought to focus its attention on the wild edible greens management practices of three prominent tribal communities of Wayanad, namely the *Paniyar*, *Kattunaikkar* and *Kurumar*. *Paniyar* are predominantly a landless group working as wage labourers and living close to agricultural landscapes, particularly the paddy fields. *Kattunaikkar* are traditionally a food-gathering tribe and live close to the forests. *Kurumar* are a settled community, living together in joint families and engaged in agriculture. In parallel, a comparative study has also been made 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 whose living is close to forests and who follow traditional paddy cultivation. The study sites at each of these locations were selected at random using

a grided map of the district. The relatively greater dependency of the *Paniyar* community on wild food was reflected in the selection of five *Paniyar* settlements in the target group. One *Kattunaikkar* colony from the dry zone and two from the wet zone were included. As lifestyle and wild resource dependency is uniform among *Kurumar*, 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 the study.

Results and discussion

The paper discusses the wild edible greens and its management options by the different communities. Wild leaves are among the most widely consumed wild foods of the district. 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 *Paniya* families. The study identified 102 wild edible leaves, but only a few species are widely used. For instance, *Paniya* women and children regularly collect only about eight species, *Kuruma* and *Kattunaikka* tribes zero in on just four such species regularly and others often make do with just three types of wild edible leaves (Table 3). The household survey revealed that *Paniya* families consume about 88 species of leafy greens followed by the *Kattunaikka*, who consume 43 species, the *Kuruma* about 21 types and the settlers restrict themselves to between 3 and 6 types of leafy greens. Most of these species are herbs (90%), and very few are trees (Table 4).

Table 3—Most frequently used greens by different socio-cultural groups

	Kattunaikka	Kuruma	Others	Plant name
Paniya	Kattunaikka	Kuruma	Others	
Ponnankanni	Ponnankanni	Ponnankanni	—	<i>Alternanthera sessilis</i>
Mudungachap	—	Kattuthakkali	Chukkootti	<i>Solanum nigrum</i>
Churuli	—	—	—	<i>Diplazium esculentum</i>
Mullancheera	Mullancheera	Mullancheerai	—	<i>Amaranthus spinosa</i>
Mullancheera chuvappu	—	—	Cheera	<i>Amaranthus spinosa</i>
Kalicheera	Kuppakeera	Vazhacheera	—	<i>Amaranthus viridis</i>
Karinthal	—	—	—	<i>Colocasia esculenta</i>
Kollithal	—	—	—	<i>Colocasia esculenta</i>
—	Maracheera	—	—	<i>Embelia tsjeriam-cottam</i>
—	—	—	Vasalacheer	<i>Basella alba</i>

Table 4—Wild plants used as greens

Local name	Plant name	User groups
<i>Alanchappu</i>	<i>Bidens biternata</i> (Lour.) Merr.	P, Ku, K, O
<i>Aliyanchappu</i>	<i>Zehneria maysorensis</i> (Wt.& Arn.)Am.	P, Ku, K
<i>Ambal</i>	<i>Nymphaea nouchali</i> Burm.f.	P, Ku, K
<i>Attanga</i>	<i>Cucumis porphetarum</i> L.	P, Ku, K
<i>Ayanichakka</i>	<i>Artocarpus hirsutus</i> Lamk.	P, Ku, K, O
<i>Brahmichappu</i>	<i>Bacopa monnieri</i> (L.) Pennell	P, Ku, K
<i>Chakka</i>	<i>Artocarpus heterophyllus</i> Lamk.	P, Ku, K, O
<i>Cheenaparangi</i>	<i>Capsicum anuam</i> L.	P, Ku, K, O
<i>Cheriyakadaaldi</i>	<i>Cyathula prostrata</i> (L.) Bl.	P, Ku, K, O
<i>Cherucheera</i>	<i>Alternanthera bettzickiana</i> .Br.	P, Ku, K, O
<i>Cherukadaladi</i>	<i>Cyathula prostrata</i> L.	P, Ku, K, O
<i>Chooral</i>	<i>Dendrocalamus strictus</i> (Roxb.) Nees	P, Ku, K
<i>Choracheera</i>	<i>Alternanthera dentate</i> Br.	P, K, O
<i>Chorakam</i>	<i>Polygonum chinense</i> L.	P, Ku, K
<i>Choriyanam</i>	<i>Laportea interrupta</i> (L.) Chew.	P, Ku, K, O
<i>Chorkam</i>	<i>Polygonum glabrum</i> L.	P, Ku, K
<i>Churuli</i>	<i>Diplazium esculentum</i> (Retz.) Sw.	P, Ku, K, O
<i>Eenthukumpu</i>	<i>Cycas circinalis</i> L.	P, Ku, K, O
<i>Hattakkeerai</i>	<i>Justicia nilgherrensis</i> (Nees) T.Anders.	P, Ku, K
<i>Hinnisan kaya</i>	<i>Tamilnadia uliginosa</i> (Retz.) Tirveng.	P, Ku, K
<i>Kadambu</i>	<i>Barringtonia racemosa</i> Bl.	P, Ku, K
<i>Kadukucheera</i>	<i>Blumea barbata</i> DC.	P, Ku, K, O
<i>Kaida</i>	<i>Pandanus fascicularis</i> Lamk.	P, Ku, K
<i>Kalicheera</i>	<i>Amaranthus viridis</i> L.	P, Ku, O
<i>Kannisoppu</i>	<i>Commeliina bengalensis</i> L.	P, Ku, K
<i>Kara</i>	<i>Catunaregam spinosa</i> (Thunb.) Tir.	P, Ku, K
<i>Karimthalu</i>	<i>Colocasia esculenta</i> (L.) Schott	P, Ku, K, O
<i>Karinkoovalam</i>	<i>Monochoria vaginalis</i> Presl.	P, Ku, K
<i>Kattucheera</i>	<i>Amaranthus caudatus</i> .L.	P, Ku, K, O
<i>Kattueenthu</i>	<i>Phoenix sylvestris</i> Roxb.	P, Ku, K
<i>Kattukaipaka</i>	<i>Momordica dioica</i> Roxb.	P, Ku, K, O
<i>Kattumandaram</i>	<i>Bauhinia purpurea</i> L.	P, Ku, K
<i>Kattumudunga</i>	<i>Lycianthes laevis</i> (Dunal) Bitter	P, Ku, K
<i>Kattupaval</i>	<i>Momordica subangulata</i> Bl.	P, Ku, K
<i>Kattupayar</i>	<i>Canavalia cathartica</i> Thours.	P, Ku, K
<i>Kattupayar</i>	<i>Mucuna monosperma</i> DC.	P, Ku, K
<i>Kattuthakkali</i>	<i>Passiflora calcarata</i> Mast.	P, Ku, K,O
<i>Kattuvenda</i>	<i>Abelmoschus angulosus</i> Wall.	P, Ku, K,O
<i>Kayalkkali</i>	<i>Bambusa arundinacea</i> Willd.	P, Ku, K,O
<i>Kayamachapu</i>	Small shrubs	P, Ku, K,O
<i>Keezharnelli</i>	<i>Phyllanthus niruri</i> L.	P, Ku, K,O
<i>Kollithalu</i>	<i>Colocasia esculenta</i> (L.) Schott	P, Ku, K,O
<i>Komaransoppu</i>	Herbs	P, Ku, K
<i>Koombichapu</i>	<i>Adenia hondala</i> (Gaertn.) de Wilde.	P, Ku, K
<i>Koovilisoppu</i>	<i>Crotalaria laevigata</i> Lam.	P, Ku, K
<i>Kozhimullan</i>	<i>Hygrophila schulli</i> Ham.	P, Ku, K,O
<i>Kozhivalan</i>	<i>Achyranthes bidentata</i> Bl.	P, Ku, K
<i>Kozhuppacheera</i>	<i>Portulaca oleracea</i> L.	P, Ku, K
<i>Kumbil</i>	<i>Gmelina arborea</i> Roxb.	P, Ku, K
<i>Kundimaruma</i>	<i>Sonerila rheedei</i> Wt.	P, Ku, K
<i>Kuniyanchappu</i>	<i>Diplocyclos palmatus</i> (L.) Jeffrey	P, Ku, K

Contd.

Table 4—Wild plants used as greens—Contd.

Local name	Plant name	User groups
<i>Kunni</i>	<i>Abrus precatorius</i> L.	P, Ku, K
<i>Kuppacheera</i>	<i>Amaranthus viridis</i> L.	P, Ku, K,O
<i>Malampuli</i>	<i>Begonia malabarica</i> Lamk.	P, Ku, K,O
<i>Malampuli</i>	<i>Begonia integrifolia</i> Dalz.	P, Ku, K
<i>Malampunna</i>	<i>Dillenia indica</i> L.	P, Ku, K
<i>Malanchuruli</i>	<i>Dryopteris coculata</i>	P, Ku, K
<i>Malankkeera</i>	Large shrubs	P, Ku, K
<i>Mancheera</i>	Small shrubs	P, Ku, K
<i>Maracheera</i>	<i>Waltheria indica</i> L.	P, Ku, K
<i>Marachembu</i>	<i>Remusatia vivipara</i> Schott.	P, Ku, K
<i>Maradasoppu</i>	<i>Capparis</i> sp.	P, Ku, K
<i>Marakkeera</i>	<i>Embelia tsjeriam-cottam</i> A.DC.	P, Ku, K
<i>Minnamkkanni</i>	<i>Alternanthera pungens</i> Kunth	P, Ku, K
<i>Minugalasoppu</i>	Herbs	P, Ku, K
<i>Motampuli</i>	<i>Physalis minima</i> L.	P, Ku, K
<i>Mudungachappu</i>	<i>Solanum nigrum</i> L.	P, Ku, K,O
<i>Mukkapeera</i>	<i>Mukia maderaspatana</i> (L.) M. Roem	P, Ku, K
<i>Mullancheera</i>	<i>Amaranthus spinosus</i> L.	P, Ku, K,O
<i>Mullancheera Chuvappu</i>	<i>Amaranthus spinosus</i> L.	P, Ku, K,O
<i>Murikkinchappu</i>	<i>Erythrina stricta</i> Roxb.	P, Ku, K,O
<i>Muthilila</i>	<i>Centella asiatica</i> (L.) Urban	P, Ku, K,O
<i>Muyalcheviyan</i>	<i>Emilia sonchifolia</i> (L.) DC.	P, Ku, K
<i>Naikkadugu</i>	<i>Cleome viscosa</i> L.	P, Ku, K
<i>Nakkuneeti</i>	<i>Ophioglossum reticulatum</i> L.	P, Ku, K
<i>Njetipanakumpu</i>	<i>Arenga wightii</i> Griff.	P, Ku, K
<i>Noolithali</i>	<i>Antidesma acidum</i> Retz.	P, Ku, K
<i>Palancheera</i>	<i>Ceropegia stocksii</i> Hook.	P, Ku, K,O
<i>Palankeera</i>	<i>Ceropegia metziana</i> Miq.	P, Ku, K
<i>Palcheera</i>	<i>Euphorbia hirta</i> L.	P, Ku, K
<i>Panamchapu</i>	<i>Caryota urens</i> L.	P, Ku, K
<i>Panchithalu</i>	<i>Cryptocoryne spiralis</i> Fisch.	P, Ku, K
<i>Panichisoppu</i>	Herbs	P, Ku, K
<i>Parachava</i>	<i>Dryopteris coculata</i> J.Sm.	P, Ku, K
<i>Parippukkeera</i>	<i>Chenopodium album</i> L.	P, Ku, K
<i>Paruthiyila</i>	<i>Hibiscus hispidissimus</i> Griff.	P, Ku, K,O
<i>Poninthavara</i>	<i>Cassia occidentalis</i> L.	P, Ku, K
<i>Ponnamkkanni</i>	<i>Alternanthera sessilis</i> R. Br.	P, Ku, K,O
<i>Poola</i>	<i>Bombax ceiba</i> L.	P, Ku, K,O
<i>Poovarasu</i>	<i>Thespesia populnea</i> Soland.	P, Ku, K
<i>Puliyarila</i>	<i>Oxalis corniculata</i> L.	P, Ku, K,O
<i>Sambarcheera</i>	<i>Talinum cuneifolium</i> Willd.	P, Ku, K,O
<i>Thaivasoppu</i>	<i>Pteridium aquilinum</i> L.	P, Ku, K
<i>Thavara</i>	<i>Cassia tora</i> L.	P, Ku, K,O
<i>Thazhuthama</i>	<i>Boerhaavia diffusa</i> L.	P, Ku, K,O
<i>Thonachisoppu</i>	Herbs	P, Ku, K
<i>Unnithandu</i>	<i>Costus speciosus</i> (Koen.) Smith	P, Ku, K
<i>Valiyakadaladi</i>	<i>Achyranthes aspera</i> L.	P, Ku, K,O
<i>Vallimaruma</i>	<i>Cissus discolor</i> Bl.	P, Ku, K
<i>Vasalachapu</i>	<i>Basala alba</i> L.	P, Ku, K,O
<i>Vattachappu</i>	<i>Marselia quadrifoli</i> L.	P, Ku, K
<i>Vayalthalu</i>	<i>Colocasia esculenta</i> (L.) Schott.	P, Ku, K,O

It was found that women play a key role in the collection and processing the edible greens. As food providers for the family, they alone, by and large, continue to possess the knowledge related to its usage. An analysis of dependency on various landscapes for collecting these plants shows that wayside and open areas provide the maximum species (28) followed by thickets and forest (20 species), paddy fields and associated ecosystems (18), river and riversides (13) and finally the marshy areas (9) (Fig. 2). There is a great deal of variation in the wild greens preferred by different communities. Since most of the leafy greens are specific to the user communities, a monthly calendar was prepared according to the "use pattern". Analysis of the monthly calendars from different communities shows that some plants are regularly used in all seasons (*Paniya* 8 species, *Kuruma* and *Kattunaikka* 4 species as vegetables). In some hamlets of *Paniya*, plants like *Churuli* (*Diplazium esculentum* L.), *Vayalthalu* (*Colocasia esculenta* (L.) Schott) and *Ponnamkanni* (*Alternanthera sessilis* (L.) R.Br.ex. DC.) are used almost every day of the week. Species like *Mudungachappu* (*Solanum nigrum* L.), *Vellachappu* and *Mullancheera* (*Amaranthus spinosus* L.) are used on an average three times a week. 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 (4-5 times a week) are species like *Ponnamkkanni* [*Alternanthera*

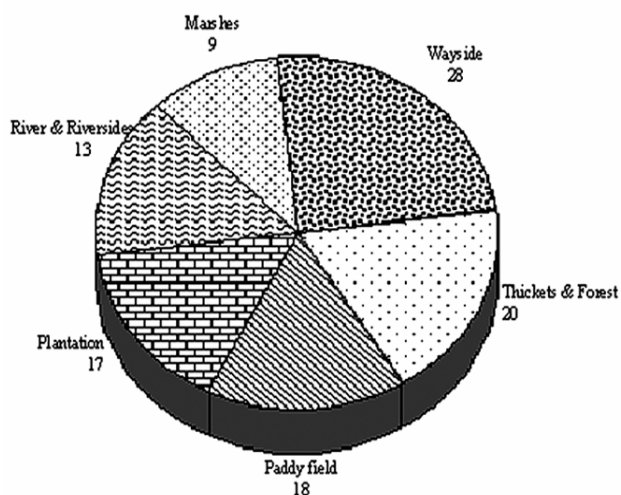


Fig. 2 Distribution pattern of leafy greens according to landscapes

sessilis (L.) R.Br.ex. DC.], *Mullencheera* (*Amaranthus spinosus* L.), *Kuppacheera* (*Amaranthus viridis* L.) and *Mudungachappu* (*Solanum nigrum* L.). The tribal communities studied consume them frequently. 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* (Roem. & Schult.) DC.), but it is consumed only by the *Kattunaikka* community. 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* (Wight & Arn.) Arn. var. *oblonga* Prasad & Mini], *Kattuthakkali* (*Passiflora calcarata* Mast.), *Kallurukki* (*Scoparia dulcis* L.), *Maracheera* (*Waltheria indica* L.), *Muthil* (*Centella asiatica* (L.) Urban), *Aalanchappu* (*Bidens pilosa* L.), *Kuriyankaya* (*Diplocyclos palmatus* (L.) Jeffrey) and *Kozhuppacheera* (*Trianthema portulacastrum* L.) fall under this category. Many of these species, except *Bidens pilosa* L., *Scoparia dulcis* L. and *Centella asiatica* (L.) Urban, 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* L. Urban) mixed with *Kozhuppacheera* (*Trianthema portulacastrum* L.) and *Kattuthakkali* (*Passiflora calcarata* Mast.) with crabs or fish. The greens, according to them, tastes better this way than when cooked separately. Some of these greens, eg. *Kuriyankaya* [*Diplocyclos palmatus* (L.) Jeffrey] need to be rather laboriously processed to remove bitterness and make it palatable, which itself is a deterrent to its frequent consumption.

Greens like *Koombichappu* [*Adenia hondala* (Gaertn.) de Wilde], *Kayalkalli* [*Bambusa arundinacea* (Retz.) Willd.], *Nakkuneety* (*Ophioglossum reticulatum* L.), *Kattukaipa* (*Momordica dioica* Roxb. ex Willd. and *Momordica subangulata* Blume), *Kozhivalan* (*Alternanthera bidentata* L.) and *Vattachappu* (*Marselia quadrifolia* L.) are greatly preferred but their consumption does not match the revealed preference. Species like *Kattumudunga* [*Lycianthes laevis* (Dunal) Bitter], *Kozhivalan* (*Alternanthera bidentata* L.),

Koombichappu [*Adenia hondala* (Gaertn.) de Wilde] and *Panachithalu* [*Cryptocoryne retrospiralis* (Roxb.) Kunth] are rare in distribution and found only in the hills. The *Koombichappu* and *Kattumudunga* are pure forest species and seen only in interior hillocks. 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* (L.) Blume], *Mukkapeera* [*Mukia maderaspatana* (L.) Roem.], *Chorakam* (*Polygonum glabrum* Willd), *Naikkaduku* (*Cleome viscosa* L.) and *Brahmichappu* [*Bacopa monnieri* (L.) Pennell]. Each community is aware of these species, but gathers them only during emergency conditions. *Paniya* families, for instance, know over 60 such species but use them only during times like severe monsoon when there is acute food scarcity.

Compared to *Paniya*, *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* (Roem. & Schult.) DC.] *Maradusoppu* (*Capparis* sp.), *Kannisoppu*, (*Commelina bengalensis* L.) and *Hattakheerai* [*Justicia nilgherrensis* (Nees) Wall. ex Anders.] are among the greens regularly consumed by the community. Among the 102 wild greens identified, *Kattunaikka* community exclusively consumes 16 species (Table 5). 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 *Marakkeera* and *Maradusoppu* are available, where as many of the other species sprout only during rainy season. *Maradusoppu* and *Marakkeera* are available throughout the summer 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.

Among the three tribal communities, *Kuruma* women are the least dependent on wild leafy greens for their food requirements due to their low preference to wild leafy greens in the diet, high preference of fried and fast food, availability/accessibility/time constraints to perceptions that accessing wild greens for food reduces social prestige. Invariably, in all *Kuruma* households, there are 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*, a predominantly an agricultural community knows 14 such greens, the Muslim and 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. The species diversity in the home gardens maintained by the settler communities does have a direct bearing on their wild plant dependency (Fig. 3). The leaves of many of home garden species are used

Table 5—Plants used as vegetables exclusively by *Kattunaikka*

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

*These species could not be collected

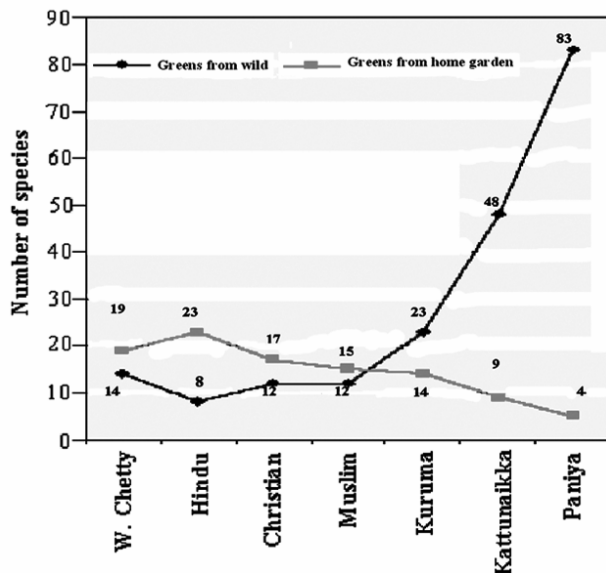


Fig. 3 Use pattern of greens from wild & home gardens among varying sociocultural groups

as greens, the most common being *Mathanchappu* (*Cucurbita maxima* Duch.), *Muringayila* (*Moringa oleifera* Bedd.), *Kumbalachappu* [*Benincasa hispida* (Thunb.) Cogn.] and *Payaruchappu* (*Vigna anguiculata* L.). 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* L.), *Vankadalady* (*Achyranthes aspera* L.), *Thavara* (*Cassia tora* L.), *Thalu* [*Colocasia esculenta* (L.) Schott], etc. for preparing the medicinal gruel *Karkkidagakanchi* and *Noyambukanchi*.

Gender roles and responsibilities assigned by the society give women the predominant role in collection and processing of wild greens for consumption¹⁸. As in the case of other socially signed female roles, this requires patience and is time consuming. Women perform all labour inputs required, from collection to processing and serving. They have knowledge about each and every plant, such as its location, availability, equation and proportion of making mixture of different vegetables, factors influencing palatability, nutritional value and so on. For collection of the greens, women of *Paniya* community walk considerably long distance compared to other category of women. *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. Interestingly, 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, which is the part and parcel of chain of learning about traditional knowledge and ethnic foods. 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. *Paniya* women depend more on open areas for wild green collection and 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 *Paniya* and *Kuruma* youth and certainly the men-folk of settled communities, look upon wild green collection is 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 *Kuruma* community.

Some of the wild greens are exploited not only for their leaves but also for other parts like *Koombichappu* flowers [*Adenia hondala* (Gaertn.) de Wilde], *Kattuthakkali* fruits (*Passiflora calcarata* Mast.) and petiole, *Karimthalu* [*Colocasia esculenta* (L.) Schott] corms and fruits. Women thus use the resource in a variety of beneficial ways, and adopt various processing methods to make the edibles consumable and palatable. *Kattunaikka* women use different species of *Kattuchena* [*Amorphophallus paeonifolius* (Dennst.) Nicols. var. *paeonifolius*] for the corms, but only after it is washed thoroughly several times in fresh water and then boiled in tamarind water to reduce calcium oxalate present in the corm. Likewise, *Vayalthalu's* [*Colocasia esculenta* (L.) Schott] 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 consuming chores to make several varieties of wild food edible and tasty. Similarly, the pods of *Kattupayar* (*Mucuna*

monosperma DC. ex Wight), 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, may be due to the high cultural ethics, that too from a larger number of available plants of the species. *Vayalthalu* and *Kollithalu* 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 sustainability of some leafy greens like *Karimudunga* (*Solanum nigrum* L.), Kuruma, women collect its mature fruits separately and throw in the nearby fields for its 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 conservation (*in-situ*) and availability of the greens. Tribal and non-tribal men and women use many of the wild food species, especially leafy greens, not just as edibles, but also for their therapeutic properties and rituals. The related knowledge is more confined to the women of the community (Table 6). Among 30 documented multiple uses of wild food species, uses known to women and men are 14 and 3, respectively, while knowledge about 13 uses are known to both. The medicinal uses of wild food pertaining to gynaecological disorders, 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.

Socio-cultural groups like Hindu, Muslim, and Kuruma 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) in general is considered a starvation month.

Women of these groups take special care to include various wild plants in their diet to improve their health. 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. During this period, some special medicinal dishes like *Karkidagakanji* are prepared using locally known medicinally important wild edible plants. *Muthiyamma* from *Puthoorvayal Kuruma* colony believes that during *Karkkidakam*, plants like *thalu* (*Colocasia esculenta*) and *thakara* (*Cassia tora*) are imbued with medicinal properties and regular use of these plants strengthens the bones and increases 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* (a kind of *Karkidagakanji*), in which they use *thalu* and *thavara* along with seeds of jackfruit.

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 *Paniya* and *Kuruma* communities. Paddy fields 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 are associated with this agro-eco system. The tribal communities like *Kurichya* and *Kuruma* completely rely on paddy cultivation and the ecosystem for their food security. *Paniya* community depends on paddy fields for employment. *Paniya* women use 19 plant species from the paddy fields and its mud bunds. Besides this, a number of rituals and traditions of *Paniya*, *Kuruma* and *Kurichya* communities are strongly intertwined with this ecosystem. Conversion of this land for cultivation of perennial crops limits the storage capacity of this “sponge” leading to water shortages in nearby wells during dry seasons, and floods during rainy seasons. 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 about chemical

Table 6—Multiple uses of leafy greens and its gendered knowledge					
Wild food	Edible part	Other uses	Who knows		
			Women only	Men only	Both Men & Women
Mudunga chappu (<i>Solanum nigrum</i>)	Leaves & Fruits	Leaf juice for stomach problems of newborn. To reduce the pain during menstrual periods	✓ ✓	— —	— —
Kattukaipa (<i>Momordica subangulata</i>)	Leaves & fruits	Leaves to cure stomach ache during menstrual periods	✓	—	—
Molankoompu (<i>Bambusa arundinacea</i>)	Young shoots & seeds	For rheumatic problems	—	—	✓
Kattukoova (<i>Maranta arundinacea</i>)	Tuber	Tuber for urinary infection	✓	—	—
Njettippana (<i>Arenga wightii</i>)	Pith powder	Leaves as a packing material	—	—	✓
Chembila (<i>Colocasia esculenta</i>)	Leaves, petiole, fruit	Venereal diseases (white discharge)	✓	—	—
Karuka (<i>Cynodon dactylon</i>)	Leaves	Leaves use during ritual functions	—	—	✓
Kattuchena (<i>Amorphophallus sp.</i>)	Tuber	Leaves use for ritual functions	—	—	✓
Muyalcheviyan (<i>Emelia sonchifolia</i>)	Leaves	Use against snake bite	—	✓	—
Karimurikkila (<i>Erythrina stricta</i>)	Leaves	Use to cure throat pain	—	—	✓
Muthilila (<i>Centella asiatica</i>)	Leaves	Pregnant women use the leaves as vegetables with coconut oil to avoid skin diseases in children	✓	—	—
		Leaf paste externally for skin diseases	—	—	✓
		To children to increase memory power. Paste of <i>Kudangal</i> along with turmeric for falling of umbilical cord. Leaves good for mouth ulcer	—	—	✓
			✓	—	—
			—	✓	—
Thakara (<i>Cassia tora</i>)	Leaves	Good for health during rainy season	—	—	✓
Puliyarila (<i>Oxalis corniculata</i>)	Leaves	Stomach problems in children due to worms	✓	—	—
Churuli (<i>Diplazium esculentum</i>)	Leaves	Urinary diseases of women	✓	—	—
Allanchappu (<i>Bidens biternata</i>)	Leaves	Jaundice	—	—	✓
Mullancheera (<i>Amaranthus spinosus</i>)	Leaves and stem	Rheumatism and urinary infection	—	—	✓
Vayal chully (<i>Hygrophylla schulli</i>)	Leaves	Urinary diseases	✓	—	—
		Jaundice	—	✓	—
Thazhuthama (<i>Boerhavia diffusa</i>)	Leaves	Chest pain	—	—	✓
Mukkappeera (<i>Mukia maderaspatana</i>)	Leaves, young fruit	Ulcer and Urinary complaints	✓	—	—
Karimkoovalam (<i>Monochoria vaginalis</i>)	Leaves	For diabetics	—	—	✓
Kadalady (<i>Achyranthes aspera</i>)	Leaves	For making <i>Karkkidakakkangi</i> during rainy season (Medicinal food to avoid rheumatism)	✓	—	—
Ponnmkanny (<i>Alternanthera sessilis</i>)	Leaves	For making hair oil and good for head ache	✓	—	—
Marachembu (<i>Remusatia vivipara</i>)	Tuber	For whooping cough	—	—	✓
Njotta-njodian (<i>Physalis minima</i>)	Fruit	Curing mouth ulcer in children	✓	—	—

pollution in drinking water sources. Loss of employment opportunities of *Paniya* women has forced them to go in search of jobs even to remote places like Coorg. 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 inextricably linked to the food supply chain. The availability of greens, fish and crabs and a host of other locally important products and associated institutions, which nurture the traditional knowledge and benefits depend on the paddy fields remaining intact.

People observed 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 like *Ponnamkanni* [*Alternanthera sessilis* (L.) R.Br. ex DC.], *Kuppacheera* (*Amaranthus viridis* L.) and *Mullancheera* (*Amaranthus spinosus* L.). The feeling that wild greens may not be safe any more has also reduced its consumption according to these women. All open clearings like waysides, grazing lands, new plantations and the fallow paddy fields are the usual sites for green leaves collection. The climate of the district is highly suitable for the fast growth of many of the exotic species. Some of these have replaced the edible greens; for example species such as *Takara* (*Cassia tora* L.), *Ponnamkanni* [*Alternanthera sessilis* (L.) R.Br. ex DC.], *Kuppacheera* (*Amaranthus viridis* L.), *Mullancheera* (*Amaranthus spinosus* L.), *Karathalu* [*Colocasia esculenta* (L.) Schott], etc. are edged out by exotics like *Arippuvu* (*Lantana camera* L.), *Congresspacha* (*Parthenium hysterophorus* L.) or *Tharapatti* [*Drymaria cordata* (L.) Edgew. & Hook.f.], etc. Sizeable areas of Muthanga sanctuary are now infested with *Arippuvu* (*Lantana camera* L.) and *Communistpacha* [*Chromolaena odoratum* (L.) King & Robins] 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* (Burm.f.) R. 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.

Interestingly, some of these alien species, as mentioned earlier, are now included in their collection of greens by *Paniya* women. *Bidense pilosa* L. (*Alanchappu* as the *Paniyas* have named it) has turned out to be a delicious supplement in their food. Among the communities studied, only *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. *Paniya* women have over the years included several other introduced species like the *Ponnamkanni* (*Alternanthera paronychioides* A. St. Hill) leaves, *Sambarcheera* [*Talinum cuneifolium* (Vahl.) Willd.] leaves and *Lantana camera* L. fruits in their diet, adding to its variety.

Conclusion

Though many of the edible greens have multiple uses and medicinal value, there is a sharp decline of interest among the present day generation because of various reasons. Women however, still play a major role in the sustainable management of the most commonly used greens, as the household nutritional security becomes their responsibility. They skillfully manage various landscapes and habitats that provide food and medicinal plants and also use a leafy green in many ways. Shift to cash economy favouring men, leaving women confined more to household and non-cash tasks. This along with several other socio-economic factors led women's position adversely affected at home and community level. The declining availability of the wild greens is leading to declining use of such foods and related drop of women's knowledge. Aggressive alien invasive species and land use changes lead to the displacement or loss of a large number of wild greens. Though some of these invasive species have been controlled to some extent by utilization purpose by women, their rapid spread creates problem for the survival of many native greens. The knowledge gained by women to use and manage in a sustainable manner even such invasive species is a dramatic illustration of the constant evolution of TK.

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