

# Traditional Use And Management of Non-Timber Forest Products (NTFPs) in Appappara Village of Wayanad District, Kerala

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**Abstract:** *The present paper aimed to document traditional ethno medicinal knowledge and various non-timber forest products collected by the four-ethnic group of Appappara village of Wayanad district, Kerala in India, viz., Ayyan's, Paniyans, Kurichians and Kattunaikkans. A field survey was conducted in the year 2017 and 2018 with a structured questionnaire. The study revealed that a total of 66 NTFPs collected by the tribes in the study area. The NTFPs collected for trade includes Cheenikka, Chunda, Kalpasam, Kurumthotti, Padakkizhangu, Honey, Honey wax and Moovila. The ethno botanical survey revealed that 52 plant species belonging to 33 families were identified for the treatments of various human and animal ailments. The most common medicinal plants belonging to herb (54%) followed by shrubs (25%), trees (8%), climber (6%), climbingherb (4%), creeper (2%) and perennial (2%). In most of the cases leaves are used as medicine. However, root, bark, latex, stem and sometimes whole plants were used as medicine. The frequency of medicinal formulation is higher for paste (28%), followed by juice (21%), decoction (19%) and powder (6%). The study focused that the major threats to NTFPs are unsustainable harvesting of forest products, habitat destruction and forest fire. The access to the forest has been reduced due to restriction to collect only minor forest products, human wildlife conflicts and low price offered to the NTFPs collected to the tribes by the government.*

**Keywords:** Ethno medicinal knowledge, NTFPs, Ayyans, Paniyans, Kurichians Kattunaikkans

## I. INTRODUCTION

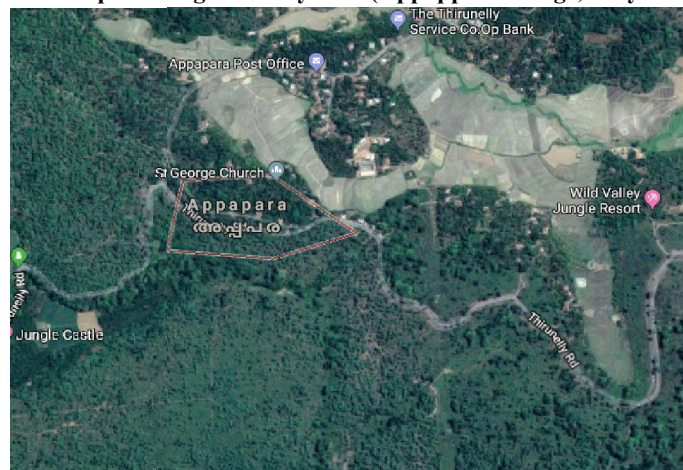
From the beginning of human civilization, primitive human beings used to live in forest nurtured by nature. The ecosystem of forest has an intimate relationship with the life of forest dwellers. The tribal community in India was fascinated the forest regions living isolated from the main stream of life. But in harmony with nature. They are in a multiplex relationship among populations of organisms for sustaining their livelihood with their habitat. Tribal in Kerala are the indigenous population in the southern India. Some of the important forest dwelling tribes in the state are cholanaikkans, Irulas, kadars, kurichians, Kurumba's, Kanikars, Muthu vans, Mannans, Malavedans, Malapandarams, Paniyas, Hill Pulayas, Uralis, and Ulladans. None-timber forest products (NTFPs) refer to a wide array of economic or subsistence materials that come from forests, excluding timber and are also termed as non-wood, minor and secondary forest products [1]. Exports of Non-Wood Forest Products and their Potential Role in Agricultural Development was much promising in India. [2] The economic importance and the values of NTFPs, has been influenced in the Sustainable development of forest products and their conservation importance. [3] The lively hood of tribal and forest dwellers are entirely dependent on forests, from which their socio-economic and cultural life has evolved [4]. The causes of deforestation in the cardamom hills in Idukki districts of Kerala and emphasised the relation between ethnic and religious communities has greatly influenced the migration, encroachment and conflicts [5]. Study in Sheopur Kalan forest division of Madhya Pradesh revealed that several commercially important species were become extinct including, *Boswellia serrata*, *Sterculia urens* and *Phyllanthus emblica*. [6]. The marketing of non-timber forest

products (NTFPs) are the main source of income to earn a livelihood for Mullukuruma tribes of Wayanad districts Kerala who have Ethno medicinal plant knowledge and 68 plants were used for medicinal purposes.[7] The assessment on the contribution of NTFPs revealed the dependency and usage pattern of forest dwellers on non-timber forest products as an income and employment and thereby ensuring food and livelihood security for the tribal economy in various Wildlife Sanctuary, including the Peechi, Vazhani Western Ghats, Kerala.[8&9] The present study was attempted with the aim of analyzing the role of NTFPs in the employment of tribal community of Appappara village of Wayanad and their associated income

## **II. MATERIALS AND METHODS**

The study has been carried out in Appappara village of Thirunelly Panchayath, Mananthavady Taluk, Wayanad district of Kerala (11°54'19.1"N 76°01'49.2"E) from the period of October 2017- March 2018. (Plate:1 1). This region is characterized with deciduous tree, evergreen and semi-evergreen forest with a cool climatic condition. It is one of the most important tea growing areas of the world. The region is also showing both cultural and socioeconomic diversity with various indigenous ethnic/tribal communities. The major ethnic groups of this region are four tribal groups viz., Adiyans, Paniyans, Kattunaikkans and Kurichians and they became a part of the socio-economic and cultural diversity of this region. All these indigenous groups of people of these regions have their own unique culture and tradition where they use different plant resources for their livelihood in their day to day life for different purposes. In the present study extensive field survey was conducted during the study period in the above-mentioned region. The detailed household surveys were done using semi-structured questionnaire regarding demographic details, traditional used patterns and management of NTFPs. Random interaction was held with elder people of sample house hold, as well as the tribal people involved in the direct collection of forest products from village, selected for this study. Data was also collected from the president and secretary of "scheduled tribe cooperative society. Discussion were conducted with personal about causes of resource depletion, implication of conservation etc. Further detailed information on NTFPs, ethnobotanical survey and their utilization patterns were collected through personal interviews and group discussion with village headman and other knowledgeable villagers of different ages, groups and sex. Authentic identification was done with the help of the Senior Scientist, V.V. Sivan from M.S Swaminathan research foundation Wayanad.

**Plate 1-Map showing the study area (Appappara village, Wayanad)**



## **III. RESULTS AND DISCUSSION**

The forest resources have been narrowed in the field of ethno medical practices which had significant role in the tribal community. Tribal community has a vast indigenous knowledge on traditional medicines for the ailment of various diseases. Present study focused on the four ethnic groups. Viz., Adiyans, Paniyans, Kurichians and Kattunaikkans and their relationship with special reference to medicinal non-timber forest products (NTFPs). The result demographic data

of sampling and the survey from the 4 ethnic groups in the study area revealed that, out of the total sample population, Adiyans were 22%, paniyans 28%, kattunaikkans 24% and kurichians were 26 % (Table: 1). Most of them leading joint family rather than nuclear. Most of them are landless especially Kurichians. Some tribes were provided with small piece of land by the Government. They have no idea about their annual income. Collection of forest products are their main source of income. But it could not meet all the requirement of their day today life and are also engaged in cooli, especially the tribal women. Most of the adult male and females were illiterate. Almost all children were school going but after schooling, the parent fail to give better education to them due to poverty and social discrimination.

**Table 1:** Demographic details of samples

Particulars	Tribal communities				
	AN	PN	KN	KR	TOTAL
No. of sample household	10	10	10	10	40
Male population	21	26	24	25	96
Female population	20	25	20	22	87
Total population	41	51	44	47	183

AN: Adiyans, PN: Paniyans, KN: Kattunaikkans, KR: Kurichians

**Non -timber forest products collected by the tribes in the study area**

The study revealed that a total of 66 NTFPs have been collected by the tribes. As per the data collected from ‘scheduled tribal cooperative society and “during the survey revealed that out of the 66 NTFPs 10 species of NTFPs were collected regularly before 2010. Most of the NTFPs used for medicinal purposes and majority of them send to Kottakkal Arya Vaidya Shala. Of these highest number of NTFPs was plant origin and only two are animal origin. Most of the NTFPs were used as ethno medicine and some are traded with the help of “scheduled tribe cooperative society. The survey revealed that the NTFPs collected by the tribes presently includes honey-wax, Honey, Cheenikka, Chunda, Kalpasam, Padakkizhangu, Moovila, Kurumthotti (Table:2., Plate:2). All the four-ethnic community in the study area was found to be settled the transition zone of the forest. But their dependency and collection of NTFPs have been shown a little variation. The ancient kattunaikkans were lived in the deeper forest and they were engaged in honey collection. Presently they were settled to outer zone of forest, even though they were engaged in honey collection. The Nectar of the honey collected by kattunaikkans during the month of April –September (Table:2). It is widely used in food as sweetening agent by various industries as well as for medicinal purposes. The honey is traded to several industries and it was brought by local people directly from “Scheduled tribe Cooperative Society”. Mezhu (Ceraalba) is also collected by the kattunaikkans which was used for making handicrafts.

Adiyans were mainly engaged in the collection of Cheenikka fruits (*Acacia sinuata*). These fruits were later used by different industrial agency for soap and shampoo preparations. The ripening stage of the cheenikka is March- April. Flower of the Kalpasam (*parmelia perlata*), root of chunda (*Solanum indicum*) and stem and root of kurumthotti (*sidacordifolia*) are collected during Oct- Nov (Table:2). Chunda and kurumthotti are used as the ingredients in the Ayurvedic medicines. But kalpasam used as the ingredient in paint and pan masala., kalpasam collected by the Kattunaikkans and while others are collected by Adiyans and Paniyans. Roots of the Moovila (*Pseudarthriaviscida*) was collected by kurichia and kattunaikkans during the month of March- April (Table:2) and was purchased by the Kottakkal Aryavaidyasala for the medicinal preparations. The root of Padakizhangu (*cyclea peltata*) was collected during the month of Oct-March (Table:2) by Paniyans which was widely used for curing the reproductive disorders.

**Table 2:** Details of NTFPs collected by different ethnic groups and their period of availability

LOCAL NAME	SCIENTIFIC NAME	PART COLLECTED	USE	TRIBES ASSOCIATED	AVAILABILITY
HONEY	-	Nector	Medicine	kattunaikka	April –Sept
KURUMTHOTTI	Sidaacuta	All part	Medicine	Paniyar, Adiyar, Kurichiar	Oct- Nov.

KALPASAM	Parmeliaperlata	Flower	Medicine ingredient in panmasala	Kattunaikka	Oct- Nov.
PADAKKIZHANGU	Cycleapeltata	Root tuber	Medicine	Paniyar	Oct-March
HONEY WAX	Cera alba	Wax	Anticrafts	Kattunaikka	April –Sept
CHUNDA	Solanum indicum	Root	Medicine	Adiyar, Paniyar	Oct- Nov.
MOOVILA	Pseudarthriaviscid	Root	Medicine	Kurichia, kattunaikka	March-April
CHEENIKKA	Acacia sinuate	Fruit	Soap, shampoo, medicine	adiyar	March-April

**Plate 2:** Photographs showing the important NTFPs Collected for Trade  
Chunda (*Solanum indicum*) Honey Kurumthotti(*Sidacordifolia*)



*Padakizhangu Cyclea peltata*) Cheenikka (*Acaciasinuata*)



Kalpasam(*Parmeliaperlata.*) Moovila (*Pseudarthriaviscida*)



### Medicinal Plants

Medicinal plants were among the main valuable NTFPs in the study area. In the present study 52 plants belonging to the 33 families were identified (Table:3). Similar Ethno botanical investigations in the Parabat districts of Nepal, identified 28 species of plants belonging 27 genera under 22 families [10]. In the present study medicinal plants constitute 54% herb, 25% shrubs, 8% trees, 6% climbers, 4% climbing herb, 1% creeper and 1% perennial (figure :2).

Many of the tribes have wide knowledge on medicinal plants, even though some of the elder ones of the tribes in the study area utilizes these medicinal plants for curing human and animal diseases. The tribes were well aware of collecting season, mode of collection and frequency of collection of specific parts of plant species.

Among 52 plant species used by the tribes, most of the species were used for single purposes, while few others used for two or multiple purposes. Padakkizhangu (*cycleapeltata*) has very important role in reproductive disorders. Unfamiliar (*Catheranthusroseus*) is the only one plant they used for cancer treatment. They were used the fresh leaves of insulin plant (*Chamaecostus cuspidatus*), Amrith (*Tinosporacardifolia* and Naruneendi (*Hemidesmusindicus*) for diabetic disorder and Gonorrhoea. *Calotropisgiganti* is used as vermicide and also for chest pain. and diabetes. In certain cases, combination of different plants is used for the treatment of disorders. *Adathodabeddomi* used for Asthma in combination with *J.beddomi*, *Hydrocotylejavanica* and *Zingiberofficinale*. These tribes were use different medicinal plants for their primary health care and other purposes based on their inherited knowledge

**Table 3: Details of Medicinal plant NTFPs, mode of preparation and their therapeutic value**

SCIENTIFIC NAME	LOCAL NAME	HABIT	FAMILY	MODE OF ADMINISTRATION	THERAPEUTIC USE
<i>Adathodabeddomi</i>	Adalodakam	Shrub	Acanthaceae	The leaf powder of dried leaf of <i>J. beddomi</i> , <i>Hydrocotylejavanica</i> and <i>Zingiberofficinale</i> is mixed with water and taken internally	Asthma
<i>Holostemma crepee</i>	Adapathiyam	Herb	Asclepiadaceae	Consume fresh tuber	Blood purification and formation
<i>Myxopyrum spicacifolium</i>	Chathuramulla	Herb	Oleaceae	Leaf decoction is pour on the swelling part	Swelling
<i>Mussaenda frondosa</i>	Vellilam thali	Shrub	Rubiaceae	The juice of tender leaf and black leaf is pour in the eye	Conjunctivitis
<i>Strychnos nuxvomica</i>	Kanjiram	Tree	Leguminaceae	Apply root paste on the bitten part	Poisoning of scorpion
<i>Cymbopogon citratus</i>	Theruvappullu	Herb	Graminae	Root paste is applied for sprain and oil from leaf for headache	Toothache
<i>Chromolaena odorata</i>	Communist pacha	Herb	Asteraceae	Leaf paste applied on wound	Healing wound
<i>Kaempferia galanga</i>	Kacholam	Herb	Zingiberaceae	Rhizome paste applied on the fore head	headache
<i>Ocimum tenuiflorum</i>	Thulasi	Shrub	Lamiaceae	Leaves are boiled in water and steam is inhaled	Cold, cough, fever
<i>Phyllanthus amarus</i>	Keezharnelli	herb	Euphorbeaceae	Plant extract mixed with rhizome paste of turmeric is used internally	Skin diseases, jaundice
<i>Tabernaemontana divaricata</i>	Nanthyarvattam	Shrub	Apocyanaceae	Flower juice along with breast milk is	Liver diseases

				used as eye drop	
<i>Andrographis paniculata</i>	Kiriath	Herb	Acanthaceae	Leaf juice is used as syrup	Liver diseases
<i>Sidaacuta</i>	Kurunthotti	Herb	Malvaceae	Root decoction is taken	Breathing problem
<i>Oxalis corniculata</i>	Puliyarila	creeper	Oxalidaceae	Leaf juice with curd is used to drink	Dysentery, Diarrhoea
<i>Urenalobata</i>	oorakam	shrub	Malvaceae	Root decoction is taken internally	Fever, urinary disorder
<i>Vetiveriazizanioides</i>	Ramacham	Herb	Poaceae	Root decoction is used during bath	dandruff
<i>Centellaasiatica</i>	Kudangal	Herb	Apiaceae	Plant extract mixed with rhizome paste of turmeric is given internally	Jaundice
<i>Aloe vera</i>	Kattarvazha	Herb	Liliaceae	Leaf past is applied on burns	Burns
<i>Coleus ambonicus</i>	Panikoorka	Herb	Lamiaceae	Leaf juice mixed with honey taken internally	Respiratory disorders
<i>Cyperus rotunda</i>	Muthanga	Herb	Cyperaceae	The rhizome paste is mixed with milk is taken internally	Dysentery
<i>Elephantopus Scaber</i>	Anachuvady	Herb	Asteraceae	Root paste is applied externally on wounds	Cure wound
<i>Emilia sonchifolia</i>	Muyalcheviyan	Herb	Asteraceae	Leaf paste is applied on the wound	Cure wound, spider poison
<i>Justiciagendarussa</i>	Vathamkolly	Shrub	Acanthaceae	The leaf decoction is used for bathing	Rheumatism
<i>Ageratum conyzoides</i>	Appa	Herb	Asteraceae	Leaf paste is applied externally on wound.	Cure wound
<i>Plectranthuswightii</i>	Murukootty	Herb	Lamiaceae	The leaf paste mixed with turmeric powder and salt is applied externally on wound	Cure wound
<i>Mimosa pudica</i>	Thottavady	Herb	Mimosaceae	Leaf paste is applied externally on wound.	Cure wound
<i>Marantaarudinaceae</i>	Kattukoova	Herb	Marantaceae	Underground part of this plant is mixed with jaggery and make paste taken internally	Improvebody vigour
<i>Cycleapeltata</i>	Padakkizhangu	Climber	Menispermaceae	Dried tubers are made into paste mixed with honey taken orally	Leucorrhoea
<i>Pseudarthriaviscida</i>	Moovila	shrub	Fabaceae	Leaf juice is mix with honey is taken internally	Asthma

<i>Phyllanthusemblica</i>	Nelli	Tree	Phyllanthaceae	Whole plant decoction is taken internally	Cure stomach related problems
<i>Tinosporacardifolia</i>	Amrith	Climbing herb	Menispermaceae	Chewing the flower of ashoka	Gonorrhoea, diabetes
<i>Saracaasoka</i>	Ashokam	Tree	Fabaceae	Root, bark decoction is taken internally	Bleeding
<i>Asparagus recemosus</i>	Satavari	Herb	Asparagaceae	Paste prepared from plant latex and half boiled egg is given	Leucorrhoea, Irregular menstruation
<i>Calotropisgigantea</i>	Erukku	Shrub	Asclepiadaceae	Juice of leaves taken orally	Induce lactation
<i>Chamaecostuscupidatus</i>	Insulin plant	Shrub	Costaceae	Hot infusion of ground root is taken orally	Diabetes
<i>Scopariadulcis</i>	Kallurukki	Herb	Scrophulariaceae	Leaf juice taken twice a day	Kidney stone
<i>Tragiainvolucrata</i>	Kodithoova	Herb	Euphorbiaceae	Leaf juice taken internally	Analgesic
<i>Boerhaviadiffusa</i>	Thazhuthama	Herb	Nyctaginaceae	Root decoction is used	Jaundice
<i>Catheranthusroseus</i>	Ushnamalari	Shrub	Apocyanaceae	Paste of entire plant is used as poultice	Cancer
<i>Cardiospermumhalicacabum</i>	Valliuzhinja	Climber	Sapindaceae	Juice is given orally	Dandruff
<i>Bacopamonnierrii</i>	Brahmi	Herb	Scrophulariaceae	Paste of flower mixed with honey is taken daily	Abdominal pain after delivery
<i>Clitreaternata</i>	Sankupushpam	Climbing herb	Fabaceae	Rhizome paste mixed with cow milk	Clean uterus after delivery
<i>Curculigoorchioideis</i>	Nilappana	Herb	Amarillaceae	Dried and unripen berry powder used	Stomach pain after delivery
<i>Piper longum</i>	Thippalli	Perennial	Piperaceae	The leaf paste is applied externally on wound.	Cough, fever
<i>Solanum torvum</i>	Putharichunda	Shrub	Solanaceae	Paste of tender culm is applied externally twice a day on wound of cattle	Wound
<i>Bambusa vulgaris</i>	Mula	Herb	Bambusaceae	The leaf paste is mixed with milk and apply on the forehead	Wound
<i>Rianuscommunis</i>	Avanakk	Shrub	Euphorbiaceae	Root paste taken orally	Headache
<i>Plumbagozeylanica</i>	Koduveli	Shrub	Plumbaginaceae	Root paste is taken internally	Induce abortion
<i>Hemidesmusindicus</i>	Naruneendi	Climber	Periplocaceae	Seed paste is used to prepare medicine	Leucorrhoea, diabetes
<i>Physalis minima</i>	Njottanjotty	Herb	Solanaceae	The leaf paste is mixed	Gonorrhoea

				with turmeric is applied to the udder of cattle	
<i>Azadirachtaindica</i>	Veppu	Tree	Meliaceae	Bark decoction is given to patients	Mastitis in cattle

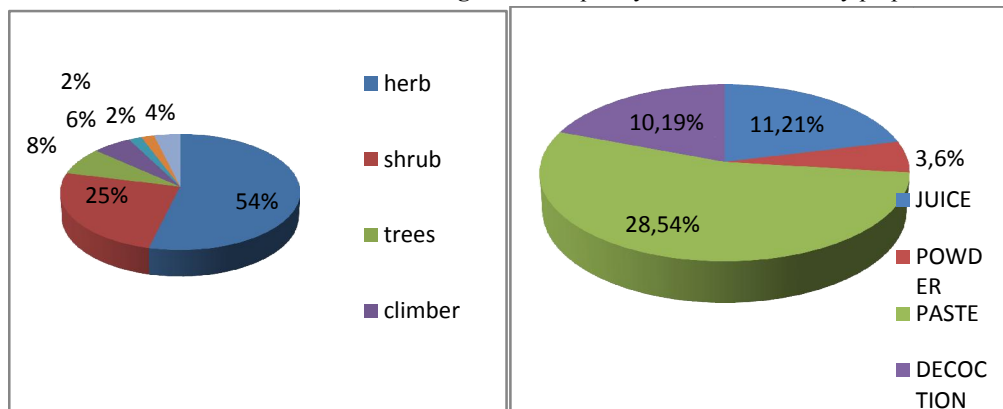
**Medicinal NTFPs in different life form**

The medicinal NTFPs in the study area distributed to different life form, with herb having the most species followed by shrubs and trees. Climbers, creepers are also seen. The medicinal NTFPs contains 54% herb, 25% shrub, 8% perennial, 6% climber, 4% climbing herb and 2% of creeper and perennial present (Figure-1). The study of the Ethno medicinal knowledge among the Adi tribes of lower Dibang valley districts Arunachal Pradesh showed that majority of the medicinal plants belonging to shrubs (46%) followed by trees (35%) and herb (19%) [11]. Contrary to this the present study indicated that herbs were the major medicinal plants followed by the shrubs. This variation in the life form of medicinal NTFPs may be due to difference in land scape and climatic variations.

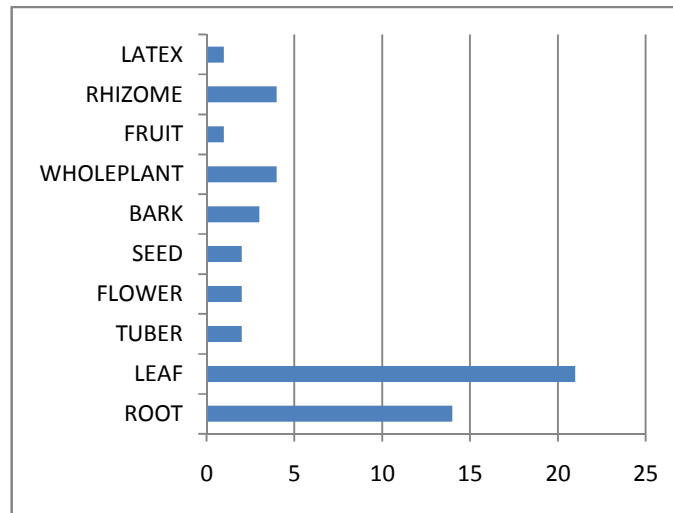
**Mode of remedy preparation and plant parts use.**

Mode of remedy preparation includes juice, paste, decoction, powder, chewing raw plant (Table: 3). The majority of formulations were prepared as paste followed by juice and decoction. Proper selection of species, part as well as preparation and administration method were very important in traditional health care system. The medicine used is 28% of paste, 21% of juice, 19% of decoction and 6% of powder (Figure: 2). Almost all plant part was used to prepare different medicinal formulation: leaves, roots, tuber, whole plant, bark, rhizome, latex, flower, seed, and fruit. The most frequently used plant part is leaves followed by root, whole plant, rhizome, bark, seed, flower, tuber, fruits and latex (Figure:3). Use of multiple plant part used as often noticed.

**Figure 1:** Medicinal NTFPs in different life forms. **Figure 2:** Frequency of Different remedy preparations



**Figure 3:** Frequency of plant parts in traditional medicines



The study classifies NTFP's according to various purposes, frequency and mode of collection and across the period by 4 groups of tribes in Wayanad, Kerala. In present study, the major NTFPs collected by them presently includes honey-wax, Honey, cheenikka, chunda, kalpasam, padakkizhangu, moovila, kurumthotti etc was found to be a lucrative source of income to primary collector households. The availability of the products over time is determined by many factors such as climatic conditions, rate and nature of extraction, regulation over extraction by the institutional agencies, forest fire, and population.[12]. Analysis of the data reveals that all these plant species selected for the present study have been recognized locally for medicinal and ethnobiological uses and their different parts are utilized as needs and purpose. This agrees with findings of different scholars. [13&14]. The forest dwellers economy is heavily dependent on precious forest resources in general and NTFP's in particular.[15] Another aspect of NTFP's procurement is the lack of full optimization of collection despite huge forest potential due to difficult terrains and inaccessible regions, constraints of market networks, poor and inadequate collection by government sponsored agencies, co-operatives and exploitative interest of businessmen, traders and middlemen, stringent forest laws etc. [16]. Since agriculture yields are lower and uncertain in many areas, the dependence on NTFP's in terms of collection, processing and marketing is still high both for food security and for household needs.[17] Some traditional ways of forest utilization are detected to be on decline which indicates changes in the usage pattern of the people who, under the influence of modernization, are shedding their conservative ways of life to seek more participation in modern social structures.[18] The livelihoods of tribal and forest dwellers are entirely dependent on forests, from which their socio-economic and cultural life has evolved.[5] Their interlinked dependency on forests, however, varies from place to place. [19] Though not always in conformity with the scientifically approved practices, the indigenous people in the region, however, tend to manage, modify and utilize forest resources with the aims in mind to earn maximum possible from the resources as well as to conserve them.

#### **IV. CONCLUSION**

For thousands of years forest and indigenous populations have evolved in symbiosis. They were depending on the forest for medicine, food and livelihood requirements. They harvest the optimum level of resources without altering the ecological balance. The present study revealed that the four ethnic groups in the study area poorly depend on the NTFPs for generating income. A total of 56 NTFPs collecting the tribes presently .out of these only 8 NTFPs used for trade. Remaining was collected, when they need for their primary health care. Their dependence was declined due to decreased availability of the resources, low price offered by the government for their collection, human animal conflicts, etc. They have vast knowledge about ethno medicine. 52 medicinal plants belonging to the 33 family were identified. Higher frequency of medicinal formulation is in the form of paste and leaves were widely used than other parts. Looking through the lens of modernisation, such precious knowledge systems have been eroding at faster rate

and at times have totally disappear in the recent past. Hence the documentation and conservation of this indigenous knowledge pertaining to plant possessed by the ethnic community from the time immemorial is essential.

#### **V. ACKNOWLEDGEMENT**

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