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STUDY OF
NON TIMBER FOREST PRODUCTS (NTFP)
IN
TROPICAL FORESTS OF WESTERN GHATS, KARNATAKA, INDIA

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Study of NTFP in Tropical Forests of Western Ghats, Karnataka, India

Half Yearly Report

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1. INTRODUCTION

1.1 Western Ghats – A rich source of biodiversity:

The Western Ghats comprise a range of hills, covered by tropical forests, starting in the southern portion of Gujarat state (21°N) at the mouth of Tapti river, and running almost parallel to the Indian West coast down to Kanyakumari (8°N) in Tamilnadu. The length of the Ghats is about 1600 km and average height about 1200 MSL. On the western side, these Ghats fall steeply to sea level and are 4-6 km to over a 100 km from the coastline. The height of these hills varies from 200m to 2600 m. The highest peak is Doddabetta near Udagamandalam in Tamilnadu at 2637 m. (Pascal 1986). The Western Ghats obstruct monsoon winds, which are responsible for seasonal precipitation in a large part of India, causing heavy precipitation in this area. The tropical heat and heavy precipitation on the slopes of the Ghats cause hot and humid climate ideally suited to plant growth. (Adkoli. 1976)

1.2 The Western Ghats in Karnataka :

1.2.1 Location: In Karnataka, the Ghats start at the border of Goa and run southwards through Uttara Kannada, Shimoga, Dakshina Kannada, Chickmagalur, Hassan, Mysore and Kodagu districts. The highest peaks in Karnataka are Kudremukh Peak (2000m), Bababudangiri, Kodachadri and Pushpagiri. The strip is narrow in Uttara Kannada almost touching the coast and it broadens in the southern part of Dakshina Kannada having a breadth of more than 100kms.

1.2.2 Rainfall: The annual rainfall in the coastal strip averages 2500-mm. and increases from the coast to the crest of the Ghats. On certain hilltops it is as high as 8000 mm. The rainfall gradually decreases towards the Deccan plateau and reduces to approximately 1000 mm on the eastern tip of the Ghats.

1.2.3 Forests: The Western Ghats support rich tropical forests.
The types of forest in this region are:

1. Low evergreen scrub on the foot-hills
2. Semi-evergreen mixed forests on the lower westerly slopes.
3. Tropical wet evergreen forests along the upper slopes and valleys.
4. Mixed moist deciduous forests on the easterly slopes.
5. Dry deciduous forests on the eastern foot-hill and
6. Grassy blanks on the higher slopes near the crest of the Ghats occurring as "downs" between wet evergreen forests called "***sholas***" in the protected valleys.

It is of interest to note that 50 per cent of forests of the state lie in this belt and over 70% of productive forests are in this region.

Tropical Wet Evergreen forests cover approx. 4,35,000 ha. The major useful species are *Dipterocarpus indicus*, *Vateria indica*, *Calophyllum tomentosum*, *Poeciloneuron indicum*, *Bischofia javanica*, *Dichopsis elliptica*, *Mesua ferrea*, etc.

Tropical Semi-evergreen Forests cover approximately 1,45,000 ha. The predominant species, are *Artocarpus hirsuta*, *Hopea parviflora*, *Eugenia spp*, *Lophopetalum wightianum*, *Acrocarpus fraxinifolius*, *Machilus macrantha*, *Mangifera indica*, *Canarium strictum*, *Disoxylum malabaricum*, etc. (Adkoli, 1976)

The Moist Deciduous Forests form over 50% of the forest in the Western Ghats and these are commercially rich. The total extent of such forests is approximately 5,00,000 ha. The major species found here are *Tectona grandis*, *Terminalia tomentosa*, *T. paniculata*, *Dalbergia latifolia*, *Lagerstroemia lanceolata*, *Bombax ceiba*, *Grewia telifolia*, *Pterocarpus marsupium*, *Xylia xylocarpa*, etc.
These forests have been partly clearfelled and converted to plantations of Teak (*Tectona grandis*), *Ailanthus malabaricum*, *Bombax ceiba*, *Eucalyptus*, etc. The extent of plantations is approximately: Teak (*Tectona grandis*) 1,35,259ha, *Eucalyptus* 1,34,777 ha, Softwoods 4093 ha, Fuel and Misc. 8,14,906 ha etc with total plantations in Karnataka being 12,24,510 ha. (Annual Report, KFD, 1996-97)

Tropical Dry Deciduous Forests form a small percentage on the lower foothills of the eastern slopes. The species found are Teak *(Tectona grandis*), with *Anogeissus latifolia* as its main associate. *Terminalia paniculata*, *Buchania latifolia*, *Semicarpus anacardium*, *Terminalia belerica*, *Emblica officinalis*, and *Pterocarpus marsupium*

Tropcal Low Evergreen Scrub is to be found only in the foothills of coastal taluks of Uttara and Dakshina Kannada Districts. The vegetation is sparse consisting of *Strychnos nuxvomica*, *Careya arborea*, *Emblica officinalis*, and some thorny shrubs like *Carissa carandas*, *Zizyphus oenoplia* etc.

Grassy Blanks along the crest and on the upper slopes of the Western Ghats are fairly extensive and their ecology is very complicated. The vegetation consists of coarse grass only. These grasses are climax vegetation co-existing with the *sholas* or low evergreens in the protected valleys. Colonisation of grassy blanks is visible only as a narrow belt of 5 to 1 m around the *sholas* by species of *Strobilanthes*. The extent of these grassy blanks is not correctly known. A fair estimate is that they are approximately over 30,000 ha. (Adkoli. 1976)

2.0 OBJECTIVES:

The objectives of the study are:

1. Study of NTFP availability, use and misuse in the tropical forests of Karnataka.
2. To develop indicators for sustainable harvesting of NTFP so as to conserve biodiversity and boost rural economy and to look at the role of middleman and commercial agencies in NTFP trade.
3. To organise NTFP collectors (forest dwellers)

3.0 JUSTIFICATION FOR THE STUDY

Along with their environmental functions, these forests support livelihoods of thousands of people living in this region. Tribal communities like Kunbis, Siddis, Jenu Kurubas, Betta Kururbas, Kudiyars, Kari vokkals and Soligas have been living in and around the forest along with the mainstream population. There is a complex relationship between these tribal communities and forests. They have been using the diverse forest resources for food, shelter and also to cure common diseases. These forest products are commonly termed as Non Timber Forest Products (NTFP) and have great importance in food security, livelihood, and employment for the local people.

In many areas collection of NTFP is one of the main sources of cash income and regular employment for people who are living in and around the forest. As the land holding is very small and marginal. The wild diversity is a source of security that provides cash income to the poorest groups. In addition to harvesting of NTFP, the indirect activities associated with it, like collection, distribution, marketing etc., employ a large number of people. Increase of monoculture plantations by aforestation programs, has reduced the ecosystem diversity and hence the yield of NTFP.

NTFP is largely available in the tropical forests. As the harvesting period is short and demand for NTFP high, people want to collect as much as possible in the shortest time. Thus they resort to highly destructive harvesting methods like lopping the branches or cutting down the entire tree itself. In the tropical forests of Western Ghats the diversity has been reduced due to this pressure and some trees are on the verge of extinction. e.g. Cinnamon, Uppage (*Garcinia gummigutta*)

The collection is done on a small scale in the village. At times the entire family, including children may be involved in the collection and processing of NTFP. The benefits here are limited. The capacity to process (drying etc.,) and store the material is also limited. The process of drying the rind of fruits also consumes a lot of wood. According to a Karnataka Forest Department estimate, 25 kg of dry wood is used to dry 1 kg of rind (Saibaba., 1996). Thus collection of NTFP may affect forest ecology both directly and indirectly.

Marketing is the biggest hurdle in utilising the NTFP. Middlemen control the entire marketing. Though the forest department allots NTFP on tender basis, the middlemen and the contractor control the trade. The pressure of storage, collection, harvesting and constant need of finance forces the forest dweller to sell his produce at a cheap rate to the middlemen. The harvesting of NTFP is a major source of employment during a part of the year. It also helps people to earn the much-required cash. The availability of NTFP is dependent on the wild diversity of the region. However, in recent years the greed to earn more money and make more profit has destroyed the diversity and has reduced the yield of NTFP.

In some parts of the region, particularly in the tribal rich areas of Mysore and Madikeri, marketing is carried out mainly through LAMPS (Large-scale Adivasi (tribal) Multipurpose Society), a cooperative society of tribals.

The increased pressure to harvest maximum quantity from the tropical forests has led to reduction of the resource base of NTFP. The examples are Uppage *(Garcinia*

gummigutta) and Dhoop (Resin from *Boswellia serrata*, *Canarium strictum*). People cut the trees to harvest more, thus reducing the chances of natural regeneration. Thus, the second-generation trees do not exist in the wild. A time may come when many species may get extinct.

The poorest forest dwellers get some income from NTFP. However, the main economic benefit goes to the middlemen and the retailer. The exploitation process gets reinforced, leading to social injustice among people. There are few people who get enormous money from NTFP and the people who toil to harvest them remain poor, without proper share from the benefits.

All these factors lead to destructive ways of harvesting of NTFP. The research project underway aims to understand the deeper issues involved in NTFP that will help in formulating a strategy for sustainable harvesting of NTFP and ensure that the poorest groups of forest dwellers get some benefit. This is one of the ways to enhance the biodiversity of the region.

Extensive logging of tropical forests of Western Ghats for timber resource and to earn revenue has adversely affected the NTFP resource. NTFP is a major resource in the tropical rainforest region that has enormous capacity for sustainable harvesting with additional advantage of generating employment. Forest dwellers who collect NTFP are not organised. There are no proper marketing or value addition channels to NTFP. Even though, NTFP provides substantial and critical contributions to the cash income of forest dwellers, the income derived from the products barely matches the minimum wages from the other occupations (Hegde, *et al*, 1995). Hence it is necessary to organise forest dwellers for sustainable harvesting and marketing.

There is no clearly defined government policy on NTFP. NTFP is constantly over exploited. There is an urgent need to evolve policy towards sustainable production of NTFP. Logging for timber has adverse effects on the tropical forests as it reduces the availability of NTFP affecting the livelihood of forest dwellers. There is an urgent need to identify the cause for its over exploitation and to involve collectors of NTFP in sustainable harvesting and conservation of natural resources. The aims to cover all the above mentioned areas and provide a database cum action strategy on NTFP for the tropical forests of Western Ghats.

CLASSSIFICATION OF NTFP: *Non- Wood (Timber) Forest Products include all goods of biological origin, as well as services, derived from forest or any land under similar use, and exclude wood in all its forms* (Chandrashekharan. C. 1995)

As the above definition says, NTFP encompasses diverse products and hence it becomes difficult to follow a definite classification system. Depending on the purpose and type of use, the availability NTFP in this region, can be classified into three categories viz., Commercial, consumptional, Medicinal. Further, consumptional NTFP can sub classified into Edible and Non-edible NTFP. Edible NTFP include all products that are edible like tubers, food supplements, wild vegetables, wild fruits, spices, items used for making pickles, fat/ oil, wine, drinks and masticators. Non edible NTFP include products used for making handicrafts like cane, bamboo etc, and fiber, thread, fuel, dye, thatch, mulch, mats, brooms, fence, wild flowers, dhoop, gums, resins, varnish, fodder, bio fertilizers, bio pesticides, items used in religious functions etc. these have been used by forest dwellers and tribals.

Commercial NTFP are the forest products, which are collected to sell and earn money. These include Uppage *(Garcinia gummigutta)*, Murugalu *(Garcinia indica)*, and Rampatre *(Myristica malabarica)* etc. These products are gaining importance recent times owing to the demand by value addition industries and external users.
Medicinal NTFP is used for local healing purposes by *Nati Vaidyas* (local doctors) and others. There are a number of plants, which have been used for medicinal purposes by local populations. More than 60% of the Indians even today depend on the *Ayurvedic (Indian traditional system)* system of medicine. Tribal healers of Karjat block of the Western Ghats use about 509 species of plants which includes 168 trees, 207 shrubs and herbs, 105 climbers and creepers, 13 grasses, 16 epiphytes and parasites. Over 7000 species of shrubs, trees, grasses, ferns, roots, and tubers are still used by India's rural communities (FRLHT, 1995)

4.0 REVIEW OF LITERATURE: Non Timber Forest Products (NTFP) give substantial inputs into the lives of a large number of people in developing countries and their production and use can constitute one of the main demands placed upon the forest resource. A complete understanding of the NTFP situation is therefore central to both the task of conserving and managing tropical forests, and of ensuring that these forests continue to contribute appropriately to the welfare of local populations. (Michael and Perez, 1996). The value of biodiversity, other environmental functions provided by tropical forests, increased awareness in use and sale of NTFP and its contribution to the household income and food security have all lead to increased attention towards NTFP.

Though collection of forest products like NTFP for consumption and medicinal purposes has been known for a long time, their collection, uses, economic importance, possible role in food security, and value addition has not been studied. There is limited literature available about NTFP in Western Ghats region.

Scientists of Tata Energy Research Institute, Bangalore, conducted one of the first NTFP dynamics studies in Biligiri Rangana Hills of Karnataka and they published a series of papers on NTFP. The first paper in these series, on contribution of NTFP to rural income (Hegde *at al*, 1995) concludes that NTFP provides substantial and critical contributions to the cash income of Soligas (a local tribal community). However, the income derived from the products barely matches the minimum wages from the other occupations. The second paper, on the impact of NTFP extraction on regeneration, population structure, and species composition (Murali *at al*, 1995) concludes that regeneration is affected by collection of seeds and fruits from NTFP species. The third paper in these series on productivity, extraction and sustainable harvest of *Emblica officinalis* (Nelli) concludes that the extraction of NTFP is having negative effect on new recruitment in the population. However, adequate control and management in harvesting NTFP can enhance rural incomes and contribute to biodiversity conservation. The fourth paper on fuelwood pressure and management options (Uma Shankar, *et al* 1996) concludes that collection of fuelwood affects biodiversity.

Janapara Vijnana-Tantra Jnana Samsthe (J V S) Dharwad, has done an important piece of work on NTFP in Uttara Kannada in Yellapur and Haliyal talukas both of which lie in the north of the district. The forest type in the study area is mainly moist deciduous and dry deciduous, with some patches of semi-evergreen in one village (Harigadde).

The study area does not completely represent the communities or eco zones of the district like crestline of Western Ghats, which is rich in NTFP and thus does not consider Uppage *(Garcinia gummigutta)*, which is an important NTFP in the district. The field work including the survey of households for socio-economic information was carried out from the end of January 1996 till May 1996. However, with this short time period of study, it is not possible to have a clear picture of NTFP issues in the district.

Another important study was done by the Institute of Social Studies Trust (ISST), Bangalore (1987). This study concentrates on collection of Uppage *(Garcinia gummigutta)* in Sirsi and Siddapur taluk. The case study focuses on the nature of participation of different groups, especially of village women in this trade and on the requirements of each of these groups. The detailed report gives information about the collection, processing, and marketing methods of Uppage *(Garcinia gummigutta)* in this region. It however does not cover other NTFP species.
A study about Minor Forest Products (NTFP), in Sirsi and Honnavar division, was done by Eco Consultants, Bangalore (1996). This study lists the NTFP species available in these two divisions, under the category of food, wild fruits, medicinal herbs, oil/nuts, cane, bamboo, fiber etc. However, the list is not complete and also the uses of NTFP are all collected from *secondary sources*. There is greater importance given to commercial NTFP, rather than consumption NTFP.
The study by P.B. Karunalkar(1996), about collection of Harda *(Terminalia chebula)* – case study, in Jagalbet Range, focuses on benefits of marketing of Harda *(Terminalia chebula)* through V.F.C. (Village Forest Committee) over the present system of giving contract to the highest bidder. This study concludes that, the right of collection of Harda *(Terminalia chebula)* through V.F.C. has been beneficial to the villager and there is need for extending the collection rights to other NTFP. (Karunakar. 1996)

However, neither of these studies bring out a clear picture of NTFP available in entire Western Ghats of Karnataka nor does it throw light on NTFP that is part of the rural life that take care of many myriad needs.
Thus it is necessary to study the NTFPs of Western Ghats as a whole, to have a clear picture of availability and to document the use pattern.

5.0 METHODOLOGY:

The study will be done in different phases. The first phase involves collection of secondary information from different sources. In the second phase, villages will be selected in the tropical forest regions to study various aspects of Non Timber Forest Produce like availability, processing and the impact of collection on livelihood of forest dwellers. In the third phase we plan to collect information about processing the Non Timber Forest Produce, marketing channels and the problems related to these issues.

Collection of **secondary data** has been collected from Forest Department, LAMPS (Large scale Adivasi (Tribals) Multipurpose Society), and other related publications.

Besides data were collected from knowledgeable individuals, villagers and forest dwellers from different areas, who are related to the region.

Village level study: A village situated close to a forest whose population mainly depends on forest resources will be selected in each forest Division and data about collection practices, NTFP available in forests around, type of uses and other related issues related to NTFP will be recorded. Besides, along with the socio economic status of forest dwellers, other NTFP related issues like, variations in availability, changes in use pattern, and religious factors attached to the collection of NTFP etc will be collected.

In the third phase, potential markets like value addition industries, *Ayurvedic (Indian traditional system)* industries preparing herbal medicines, which are using medicinal herbs as raw material, present system of marketing channels, etc will be studied.

5.2 MATERIALS:

5.2.1 Questionnaires:

Questionnaires with a participatory approach for collecting data from secondary sources, forest dwellers, nati vaidyas (local healers), value addition industries have been designed.

5.2.2 Participatory Rural Appraisal (PRA): Techniques of PRA will be used for collection information from forest dwellers. Standard PRA techniques like Participatory mapping, Focus Group Discussion, Venn diagram, Resource flow map, Transect walk, Trend analysis, Seasonality map, etc. will be used for the same.

6.0 PROJECT ACTIVITIES:

6.1 Identification of field research assistant: Field research assistants were identified in all the districts. Knowledge of the forest products available in the area and capacity of collecting authentic data about the same from local people were the main criteria, we had before selecting research assistants. These research assistants are individuals who belong to the respective regions, well aware of the social, cultural, religious, economic and other societal dynamics of the area. Another reason for choosing research assistants from the same areas was also to ensure obtaining of authentic data. Usually forest dwellers hesitate to answer questions about forest products, as they fear that may be information for the forest department. This is because of the attitude of forest department is to alienate the villagers from the forests in order to "*safeguard*" natural resources. So they are hesitant and sometimes refuse to answer questions or participate in discussions. It is expected that this problem will not arise when it is their own people asking them questions and the research assistants will be in a better position to explain to them the needs and objectives of the study and also answer their queries about the study itself.

6.2 Identification of study areas: In each District of Western Ghats, areas with good tropical forest and forest dwellers were identified. Areas were selected in such a way that so as to represent the whole forest division and eco zone of the particular division and to cover user groups like tribal and other forest dwellers. It is argued (Godey and

Bawa, 1993) and our experiences in the field revealed that dependence on NTFP is associated with traditions, cultural isolation, and other social and technological factors like capital and poor access to market. Before selecting the particular site, information about availability of NTFP, collection practices, collector groups etc were collected from the secondary sources.

7.0 STUDY AREA

In Karnataka, the Western Ghats span the districts of Belgaum, Uttara Kannada, Dakshina Kannada, Shimoga, Chikmagalur, Kodagu and some parts of Hassan and Mysore, all of which are part of the study. Refer Table 8 for the areas of each of these districts under Western Ghats.

7.1 Uttara Kannada District:

General: Situated on northern side of the state, the district has more than 60 % of its land under thick forest cover. The district is bordered by Goa to the North, and the Arabian sea to the west and has four distinct geographical zones viz., coastal strip in the west, crest line of Western Ghats, middle hilly region of the Ghats and the eastern plains. Accordingly the district is represented by, all the Western Ghats forest types. The forests are under the administration of the Canara circle, having its head office at Sirsi.

Forest type: Forest types include Coastal scrub, Tropical evergreen forest in the foot hills and crest line of the Western Ghats, Moist Deciduous Forest, and Dry Deciduous Forest. All these types support a number of NTFP species.

7.2 Belgaum

General: Only Khanapur taluk of Belgaum District is part of the Western Ghats. Bordered by Goa to the west and Uttara Kannada district to the south, the area supports tribal communities like Kunbis and Marathas. Khanapur, Nagargali, Kanakumbi, Londa, and Golihalli are the forest ranges that are part of the Western Ghats.

Forest type: The area is covered by Moist and Dry Deciduous types of forests. Except for Londa Range, some of the areas were converted into monoculture plantations of Teak during colonial period itself.

7.3 Dakshina Kannada

General: A district with a narrow coastal strip, which runs parallel to the Arabian sea, but broadens to as much as 100 km in the southern part. Being one of the highly populated districts of Karnataka, it has natural tropical forests only in areas nearer the foothills of Western Ghats. Recently the district was divided into two districts viz., Udupi in north and Mangalore in the south. The forests of these two are under the administration of Kundapur and Mangalore forest Divisions respectively, in Kodagu Forest Circle.

Forest type: The type of forest that can be seen in the District is coastal scrub and tropical evergreen in foothills of Western Ghats.

7.4 Shimoga:

General: Situated in the higher altitudes of Western Ghats, the District hilly with plains to the East and eastern plains. Sagar, Hosanagar, and Thirthahalli taluks of this

District are part of Western Ghats. The forests of this district are under the administration of Shimoga circle. The forest divisions under Shimoga Circle are Sagar and Shimoga in Shimoga District; and Koppa and Chigmagalore of Chikmagalore Disttrict.

Forest type: The types found in the District are mainly Evergreen, Moist Deciduous and Dry Deciduous forests. The District has almost all the NTFP species that are found in these forest types.

7.5 Chikmagalur

General: The District is situated south of Shimoga, and has undulating hills and is at a higher altitude than the above Districts. Bababudangiri is the highest peak in Western Ghats of Karnataka at 1900 m. Naturally, the District is less tropical than the above Districts. Coffee is the major commercial and popular crop, growing here. Stringer, Chop, Muddier, are the taluks situated adjacent to the crestline and Narasimharajapur taluk is in the middle of the District. The Taluks, which are adjacent to the crestline, have evergreen type of forest whereas Narasimharajapur taluk has Dry Deciduous type of forest.

Administration of these forests is under Koppa and Chikmagalur Divisions of Shimoga circle.

Forest type: Evergreen and deciduous type of forests are found here.

7.6 Kodagu

General: Kodagu District bordered by Kerala to the south, Dakshina Kannada to the west, and Mysore to the east has a highly undulating terrain. The rich forests here have been converted into coffee and a few cocoa plantations. The District has three Taluks. The forest area is under the administration of Kodagu Circle.

Forest type: The District has evergreen type of forest mainly on the western side with areas like Brahmagiri in the south and Pushpagiri in the North. To the east are dry deciduous forests. Moist deciduous types of forest are found in areas like some parts of Rajiv Gandhi (Nagarhole) National Park.

7.7 Hassan:

General: Only Sakaleshpur Taluk of this District is part of the Western Ghats. The Eastern part of this taluk has been converted into plantations; while the western side still has thick tropical evergreen forests near crestline of Western Ghats.

Forest type: Forest type is mainly semi evergreen and wet evergreen in the crestline area and small patches of Moist Deciduous type of forest around Sakaleshpur.

7.8 Mysore:

General: The District is situated in the southern most part of the state. Separated by a belt of thick Moist Deciduous type of forest, from Tamilnadu and Kerala. This forest constitutes three major wildlife sanctuaries, viz., Madhumalai, Nagarhole and Bandipur.

Forest type: Type of forest commonly found is Moist and Dry Deciduous type.

8.0 RESULTS:

8.1 NTFP IN TROPICAL FORESTS OF WESTERN GHATS, KARNATAKA:

The Tropical forests of Western Ghats provide diverse products collected by forest dwelling communities, from food to utility articles like the plough. Strangely they do not find a place in the records of the Karnataka Forest Department (KFD). The department auctions only NTFP of commercial value and data about the same can be found in their, records. (Refer Table – 2)

There are 24 varieties of NTFP in the official list of Karnataka Forest Department. These includes canes, Beedi leaves, oil seeds, honey and wax, tamarind (*Tamarindus indica*), Sheegekai *(Acacia concinna*), Antwalkai (*Sapindus laurifolis*), spices like wild pepper *(Piper nigrum*), Dalchini leaves *(Cinnamomum zeylanicum)*, Rampatre (*Myristica malabarica) etc.* Maximum quantity of Shigekai (*Acacia concinna*) is available in Kodagu circle.

Availability of cane decreased rapidly from 929570 numbers in 1993-94 to 229703 in 1996-97 (Figure-1). A minimum of 48 tones of Antwalkai *(Sapindus laurifolis)* was collected during 1994-95 and maximum of 163 tones was collected during 1995-96. Tamarind (Tamarindus indica) is one of the major contributors for income from NTFP to forest department. 3517 tones were collected during 1995-96 and it was minimum with 911 tones during 1996-97.

In general, there is a decreasing trend in availability of all NTFP. However, there are some variations in figures of available quantity. This is because, all NTFP are auctioned for two years and contractors submit the figures of collected NTFP, once in two years.

Division wise collection of data under the current project is in progress. Results from the survey done so far are discussed here, while the remaining will be added later.

8.2 BELGAUM DIVISION: As discussed earlier, only Khanapur taluk of Belgaum Division is under Western Ghats. Even though there are nine ranges in Belgaum forest Division, only five ranges are part of the Western Ghats. They are Khanapur, Londa, Kanakambi, Nagargali, and Golihalli. The NTFP available in these ranges are Harda *(Terminalia chebula)*, Shigekai (*Acacia concinna*), Dalchini (*Cinnamomum zeylanicum*), Nellikai (*Emblica officinalis*), Honey, Wax, and Hulagala seeds.

8.2.1 Availability: Output of NTFP in Belgaum Division is given in Table -3. Canes were collected from the Division until 1994. But after that, yield decreased considerably. Hence, there is no record of collection after 1995. Even in earlier years, there was a trend of continuous decrease. However, it was found that a small amount of cane was collected by forest dwellers in rural areas for their household use.

Harda or Alalekai *(Terminalia chebula)*, is one of the highest available NTFP in Division. In 1996-97 about 800 tones of Harda *(Terminalia chebula)*, were collected from the Division. Another NTFP that was collected in large quantities was Dalchini (*Cinnamomum zeylanicum*) leaves, which was about 190 tons during 1996-97. The quantity of oil seeds collected increased from 2 tones in 1994-95 to 28 tones in 1996-97. Other NTFP available in the district are Honey and wax, Barks of Dalchini

(Cinnamomum zeylanicum), Tamarind *(Tamarindus indica)*, Sheegekai (*Acacia concinna*), Cashew (*Anacardium occidentale*), fodder grass, gums etc.

8.2.2 Revenue from NTFP: The auctioned prices of NTFP by forest department during 1996-97 Rs. 42,04,500.00. Harda *(Terminalia chebula)* and Shigekai *(Acacia concinna)* are main contributors to revenue of Belgaum Division.during 1996-97 Harda was auctioned for Rs.17,28,000/- and Shigekai for Rs.12,96,000/-. Shigekai *(Acacia concinna)* and Harda (*Terminalia chebula*) were auctioned for whole Kanapur taluk, covering all ranges, to attract contractors. Another major contribution is from Dalchinni (*Cinnamomum zeylanicum*) leaves, which was auctioned for Rs.10,63,000/-. In Londa, Dalchini (*Cinnamomum zeylanicum*) auctioned for maximum of Rs. 6, 37, 000/- and it is not at all available in Golihalli. Nellikai (Amla) (*Emblica officinelis*)is available in all ranges, but total income from all ranges is Rs 21,000/- only.

8.3 MYSORE:

8.3.1 General: Mysore, the old capital of Karnataka, with a grand heritage, has darkness in the southeastern side of the district. The Taluks like Heggada Devenakote, Chamarajnagar, and Gundlupet have a majority of people below the poverty line. Tribals like Jenu kurubas, Betta kurubas, and Soligas are living in the District in primitive conditions. Their life once depended on the forest only. They collected about fourteen types of tubers as their food. They practiced shifting cultivation. The tribals had been living in the forests without feeling the pressures of modern living. Their needs, which were few, were met by natural resources available around them. Life revolved around the forests and hence there was a constant and dynamic interaction between the tribals and the environment in which they lived. Food requirement was supplied either by agriculture or collecting wild food. Meat requirement was met by hunting animals like wild boar, chital, hare etc.

But presently the picture is changing. Tribals are living outside the forests, mostly on its fringes, being forced out by forest laws. In H.D.Kote taluk, tribals have been forced out twice because of the construction of the Kabini reservoir and Forest Conservation Act (Gunde reserve forest). A number of NGOs and other social development forces have been working in this area for the upliftment of these tribals. As shifting cultivation and hunting were banned, and tribals got pushed into searching for alternative ways of earning or *exchange economy* and the dependence on NTFPs for income increased, even as their access to forest was denied. Traditional values collapsed, new external social values are constantly impacting on these traditions. The entire tribal group was changing and there is a definite crisis occurring.

Thus all the traditional skills, knowledge about the tropical forest were disappearing from the whole tribal group. An attempt will be done to document this knowledge from tribals in the second phase of the project.

In first phase we were able to collect the secondary data from different sources.

According to forest sources, the leased NTFP available H.D.Kote of the district are honey and wax, Harda *(Terminalia chebula)*, Gum, Amla *(Emblica officinelis)*, Tree moss (lichen), Magali beru, Tamarind, Ivory and some wild flowers.

8.3.2 COLLECTION PRACTICES: One of the tribal groups, Jenukurubas (honey shepherd?), as the name itself reflects, from this area has specialised in collection of honey from the wild. They have been extracting honey in a sustainable fashion. They have been collecting honey from rock bee (*Apis dorsata*) as well as *Apis cerana.*

8.3.3 MARKETING: Marketing is done mainly through LAMPS (Large-scale Multipurpose Cooperative Society Ltd.). Karnataka Forest Department leases/ auctions the forest products once in two year. Prices are decided upon the *upset price*, which is the average of prices of previous three terms from market and an increase of 15% on that. Contractor (LAMPS) has the permission to collect NTFP from forest through its members. The auctioned amount is paid in four installments.

Each LAMPS applies to the Karnataka Forest Department (KFD) for grant of a lease to collect NTFP from forests in that taluk. KFD grants the lease for some designated areas in return for royalty. LAMPS announces the collectors price, (price to paid to the tribal collector) for each product before its season begins. Tribals harvest the product and deliver it to LAMPS which then auctions off the entire quantity to the highest bidder. Profits, if any, are supposed to be deliver to all its member through dividends (Lele and Rao, 1996).

Availability: The auctioned NTFPs from KFD are, honey and wax, lichen, Harda *(Terminalia chebula)*, Tamarind, Gum, Amla *(Emblica officinalis)* etc. Honey is a popular NTFP and 4451kgs were collected during 1992-93.
In Gundlupete Division Gum, Harda *(Terminalia chebula)*, Amla (Emblica officinalis), Tamarind(Tamarindus indicus), Honey and wax and Kasabaralu (Broom sticks/ grasses) are available. Gum, and tamarind re major contributors to forest department.. Quantity and hence income from tamarind shows a decreasing trend. It was 20000 kgs during 1993 –95 period and just 1000 kgs in 97-99 period.
In Heggada Devana Kote Division, Harda *(Terminalia chebula)*, Amla (*Emblica officinalis*), Tamarind (*Tamarindus indicus*), Honey and wax, tree moss, Magali beru, Aleberu, (Both these are used for making pickles and medicines) and Maratti hoovu. As one of the local informants said, Maratti hoovu, is used for making paints.
Amla (*Emblica officinalis*) is available in large quantity with 74000 kgs. There is always an increasing trend in quantities available. It was 12000 kgs in 1991-93 period and 74000 kgs in 1995 –97 period.

Revenue from NTFP:- In Gundlupet Division, Gum was auctioned for Rs. 56000/- for the period of 1997 to 99 where as it was auctioned for Rs.19000/- in H.D.Kote Division. In H.D.Kote Division, Amla was auctioned to LAMPS (Large scale Adivasi (Tribal) Multipurpose Society) for Rs. 175000/- for the period of 1995-97 where as it is just Rs. 15000/- in Gundlupet Division.

8.4 NTFP IN UTTARA KANNADA:

Uttara Kannada District has diverse forest types of found in whole belt of Western Ghats and hence the forest products available in this particular District are also diverse.

8.4.1 History of NTFP in Uttara Kannada District:

Before Canara district came under British rule, its forests supplied the ship building yards of famous Hyder Ali (1761-1782) with the finest teak and other timber. Teak, black wood, and sandal wood even when growing in occupied land have always been considered the property of the state and so highly were the forests valued that no portion of them has ever been alienated. (In Dec, 1865 Uttara Kannada district was created after dividing Canara District).

In the forests of Uttara Kannada, 19 kinds of forest products have been reserved for Government. These include, Myrobalans (Harda, *Terminalia chebula*), Shigekai *(Acacia concinna*), Catechu, Honey and wax, Cinnamon, Pepper and grass. Forest Department gathers myrobalans and soapnuts. Since Soapnut (A*acacia concinna*) is of little value, it is gathered only every second year. Average revenue from seven years was Rs.6560. In 1877-78 itself, 2782 Khandis of 560 pounds each were brought into the forest source and sold at Rs. 51060, earning a net profit of Rs. 29,590.00.

Table -1

Revenue from some of NTFP in British period (1877-78)	
Name of NTFP	Revenue(Rs.)
1. Myrobalans (*Harda*	40,490.00
2. Soapnut (Shigekai)	2,030.00
3. Catechu (kat)	3,640.00
4. Honey and wax	3,390.00
5. Cinnamon	1,560.00
6. Pepper and Grass	5,010.00
Source: Gazattere of Kanara District	

8.4.2 NTFP in Uttara Kannada District (Kanara Circle):

Even though in colonial period itself, NTFP of the District was collected for commercial purposes, villagers were not mainly involved in collection, specifically for marketing purposes. Government middlemen were involved in gathering of these commercial products. But it is after independence, that the commercial market for NTFP were explored, and opened for forest dwelling communities.

Traditionally, forest dwelling communities were collecting NTFP, essential for their livelihood and basic needs. In those days NTFP provided forest dwellers like raw materials for making handicrafts, utensils, and other necessary agricultural implements.

In recent years, prices of some of the forest products have increased abruptly owing to the demands from distant areas. Thus villagers started to collect these NTFP out of commercial interest.

Some of the NTFP collected for commercial purpose are, Uppage *(Garcinia gummigutta)*, Harda *(Terminalia chebula)*, Honey and wax, Murugalu *(Garcinia indica)*, Rampatre *(Myristica malabarica)*, Shigekai (*Acacia concinna*), and Watehuli (*Artocarpus lacoocha*). Earlier, bark of Gulamanvu, Dhoop (*Canarium strictum*), etc

were collected for commercial purposes. They were banned recently by Forest Department after it is found that the species is on the brink of extinction.

Availability: Uppage (*Garcinia gummigutta*) is the major NTFP available in the Kanara circle. In Sirsi Division of Kanara Circle alone, it was 189.36 quintals in 1990 –91. Besides this, Canes, honey, wax, Sheegekai (*Acacia concinna*), Beedi leaves, Harda (*Terminalia chebula*), Antwalkai (*Sapindus laurifolis*), Dalchini leaves, etc.

However, it is impossible to arrive at a conclusion about the availability of these products based on these figures supplied by Forest department because these are the figures supplied by the contractors. These NTFP are auctioned for two years period. Though contractors are supposed supply the data about quantity collected every year some of the forest officials, we met, complain that they are not regular. Also, it is learnt that, such figures of availability do not represent the actual figures.

9.0 RESEARCH ON NTFP: WORK PLAN

Progress of 1st phase of the project:

Secondary data: Collection of data from all the forest divisions and other secondary sources were under process. We could able to collect secondary data from Mysore and Belgaum Divisions. Data from Shimoga forest circle have to be collected. In second phase, we hope to collect the remaining data.

Identification of study sites: We were able to identify following specific study villages in different Forest Divisions. Field research assistants were identified from all these study villages. Documentation of use pattern, type of NTFP available in the villages and changes in use pattern etc are under progress.

Indicators for future work: (Work to be done)

2nd phase: In the second phase information on socio-economic status of forest dwellers in study villages and NTFP available in the forests of the villages, use pattern, changes in use pattern, and other NTFP related issues from all study villages using questionnaire and PRA methods will be collected. Nati Vaidyas (local healers), value addition industries, and other '*markets of NTFP*' will be identified.

3rd phase: In the third phase the marketing channels, problems and other issues related with NTFP will be documented.

4th phase:

Objective of this phase is to develop indicators for sustainable harvesting of NTFP. This will be done in two ways;

1) Biologists' workshop:
2) Local knowledge – PRA Techniques and Questionnaire will be used to collect the information in traditional systems with forest dwelling communities.
3) Organizing NTFP collectors: Work shop of forest dwellers will be done to organise them.

Table -2

OUT TURN OF NTFP IN KARNATAKA STATE

	PRODUCE	1993-94	1994-95	1995-96	1996-97	UNIT
1	BEEDI LEAVES	1081	1121	1379	520	Tones
2	OIL SEEDS	15	39	34	12	Tones
3	HONEY	36	39	48	24	Tones
4	WAX	3	108	16	2	Tones
5	TAMARIND	1671	1839	3517	911	Tones
6	SEEGEKAI	565	552	920	405	Tones
7	CASHEW	130	324	316	72	Tones
8	ALALEKAI	167	369	283	203	Tones
9	ANTWAL KAI	76	48	163	103	Tones
10	SPICES	234	236	153	325	M.T.
11	OTHER SEEDS	111	32	912	644	Tones
12	FRUITS	499	147	311	156	Tones
13	EUCALYPTUS IOL					Tones
14	FODDER GRASS	1478	1566	432	1608	Tones
15	ROSHA GRASS	241	242	2	2	Tones
16	GUMS	35	26	36	2	Tones
17	IVORY	196	429	1700	108	Tones
18	CHARCOAL	3	253	804	882	Tones
19	OTHERS	537	890	2512	540	Tones
20	ROSHA OIL	2000	1500	1	0	Kgs
21	ALAMADDI	4	0	0	100	Kgs
22	BARKS	235	131	113	0	Kgs
23	CANE	929570	841481	441980	229703	Nos

SOURCE:

Annual Administration report, Karnataka Forest Department. (1997-1998)

Table -3

OUT TURN OF NTFP IN BELGAUM DIVISION

PRODUCE	1990-91	93-94	94-95	95-96	96-97	Unit
CANE	155050	17000	55000	0	0	No.s
BEEDI LEAVES	10.20	3	5	0	0	Tones
OIL SEEDS	0.00	0	2	12	28	Tones
HONEY	1.72	1.500	5	2	1	Tones
WAX	0.78	0.600	5	0.25	0.1	Tones
BARKS	0.00	0	1	50	0	Kgs
TAMARIND	3.00	2.000	10	7	18	Tones
SEEGEKAI	21.00	20.000	60	24	45	Tones
CASHEW	0.50	0.100	7	2.5	1	Tones
ALALEKAI	12.00	4	60	50	800	Tones
ANTWAL KAI	0	0	0	3.5	1	Tones
ALAMADDI	0	0	0	0	0	Kgs
SPICES	0	0	0	5.5	190	Tones
OTHER SEEDS	0	0	0	0	0.5	Tones
FRUITS	0	0	10	0	0	Tones
EUCALYPTUS IOL	0	0	0	0	0	Tones
ROSHA OIL	1.500	2000	1.5	1	0	Kgs
FODDER GRASS	0	0	8	5	1	Tones
ROSHA GRASS	0	0	0	2	1	Tones
GUMS	0	0	0.5	2	1.5	Tones
IVORY	0	0	0	0	0	Tones
CHARCOAL	0	0	0	0	0	Tones
RUBBER	0	0	0	0	0	Tones
OTHERS		0	0	0	0	Tones

Source:
Annual Administration report, Karnataka Forest Department.

Table -4

Auctioned prices of NTFP in Belgaum Division(1997-98)

(WesternGhats area) in Rupees

Name of NTFP	Ranges which are under Western Ghats					Total
	Khanapur	Londa	Kanakumbi	Nagargali	Golihali	
Honey and Wax	3000	25000	NA	4000	NA	32000
Nellikai(Amla)	7400	8600	2000	2000	1500	21500
Dalchinni leaves	81000	637000	333000	12000	NA	1063000
Hulagala seeds	38000	NA	8000	12000	6000	64000
Shigekai	***	***	***	***	***	1296000
Harda	****	***	***	***	***	1728000
					Grand Total=	4204500

Note: *** These are auctioned for whole Khanapur taluk

Table -5

Auctioned prices and expected out turn of NTFP from LAMPS in Mysore Division

Gundupet Division

Name of NTFP	Auctioned for years (two years)								
	1993 to 1995			1995 to 1997			1997 to 1999		
	Quantity(Kg)	Price/kg	Total value(Rs)	Quantity	Price/kg	Total value	Quantity	Price/kg	Total value
GUM	10000	12	120000	1500	12	20700	4000	14	56000
HARDA	4000	1.5	6000	5000	1.5	8625	7500	2	15000
AMLA(WET)	4000	1	4000	15000	1	17250	10000	1.5	15000
KALLUPASE	1000	7.5	7500	3000	7.5	25875	3000	9	27000
TAMMARIND	20000	6	120000	3000	6	20700	1000	7	7000
HONEY	2000	10	20000	500	10	5750	500	11.5	5750
KASABARALU	600	1	600	2000	1	2415	1500	1.5	2250
			278100			101315			128000
Finally sanctioned value=			280000			102700			138000

Heggada Devana Kote

	Auctioned for years (two years)								
Name of NTFP	1991-93			1993 to 1995			1995 to 1997		
	Quantity(Kg)	Price/kg	Total value(Rs)	Quantity(Kg)	Price/kg	Total value(Rs)	Quantity	Price/kg	Total value
GUM	1000	5	5000	2000	12	24000	2300	7	19000
HARDA	0	0	0	1000	1.5	1500	250	1.5	500
AMLA (wet)	12000	3	36000	2000	1	2000	74000	2	175000
TREEMOSS	10000	5	50000	2000	7.5	15000	1500	5	8900
TAMMARIND	5000	5	25000	6000	6	3600	0	0	0
HONEY	1500	4	6000	4000	10	40000	1150	6	8000
ALEBIRU	0	0	0	20	67.5	1350	0	0	0
WAX	0	0	0	30	10	300	0	0	0
MAGALIBERU	0	0	0	0	0	0	800	6.5	6000
MARATTI HOOVU	50	1	50	0	0	0	0	0	0

Source:
Annual Administration report, Karnataka Forest Department.

Table -6

Out turn of NTFP's in Canara Circle

PRODUCE	1993-94	1994-95	1995-96	UNIT
CANES	854711	644211	368980	Nos
BEEDI LEAVES	4	35	3	Tones
OIL SEEDS	0	0	0	Tones
HONEY	8	11	13	Tones
WAX	1	2	4	Tones
BARKS	0	0	0	Kgs
TAMARIND	0	0	12	Tones
SEEGEKAI	37	108	95	Tones
CASHEW	0	34	65	Tones
ALALEKAI	0	140	42	Tones
ANTWAL KAI	1	2	6	Tones
ALMADDI	0	0	0	Tones
SPICES	0	0	0	Tones
OTHER SEEDS	0	0	210	Tones
FRUITS	116	0	0	Tones
CHARCOAL	0	20	0	Tones
OTHERS	80	307	41	Tones

SOURCE:

Annual Administration Report

Karnaaka Forest Department

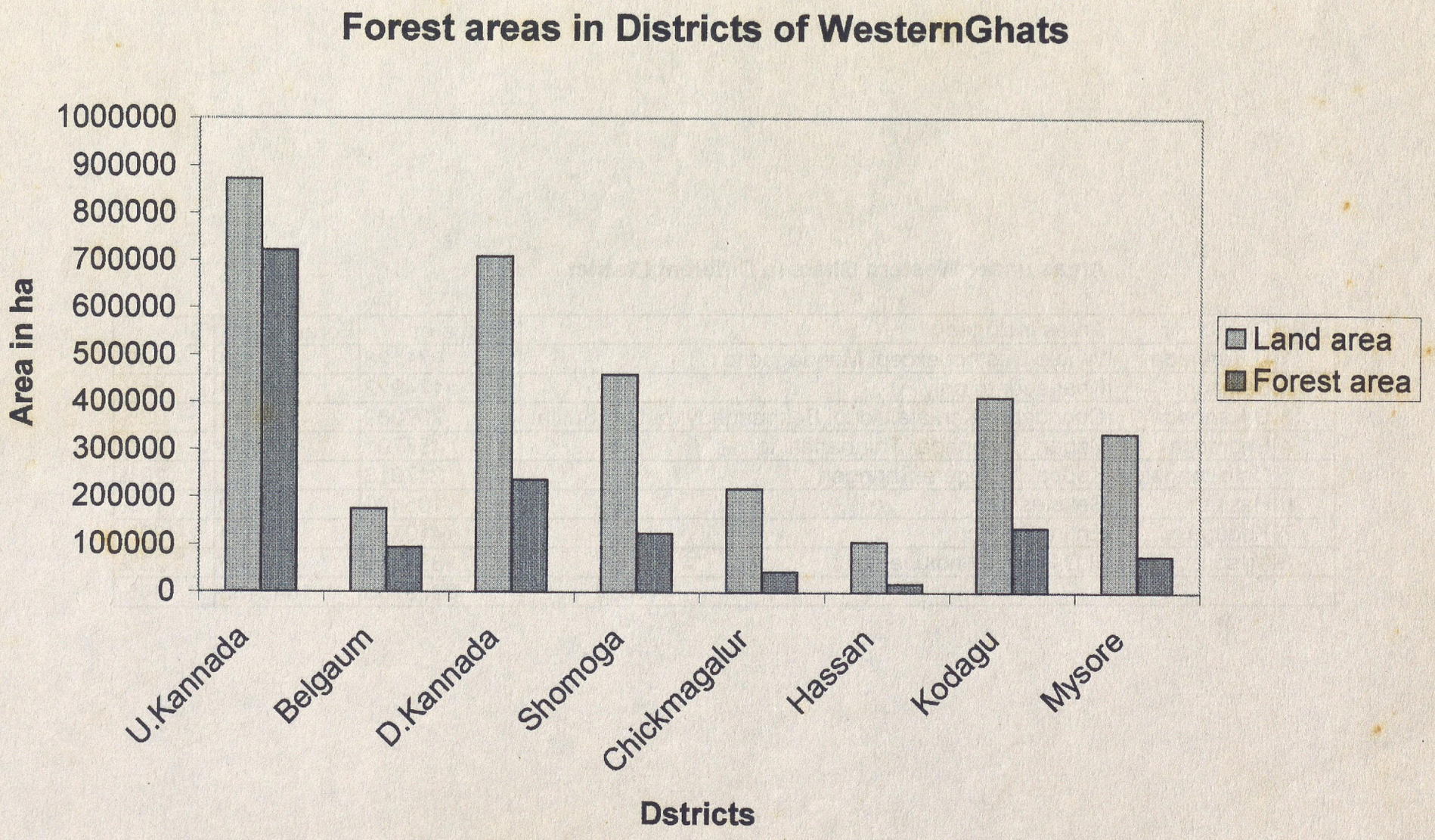
Table - 7
Study areas identified for field research in Tropical forests of Western Ghats of Karnataka

S.No.	Forest Circle	Forest Division	Range	Study village
1	Shimoga	Sagar	-	Kogar
2		Hosanagar	Nagar	Bilur
3		Thirthahalli	-	(Yet to confirm)
4		Chikmagalur	Mudigere	Hanumanahalli
5			Sakaleshpur	(Yet to confirm)
6		Koppa	Shringeri	Markal
7			N.R. Pur	Muttodi
8	Belgaum	Belgaum	Londa	Varkad
9	Mysore	Mysore	Saragur	Kenchanahalli
10	Mercara	Mercara	Sampaje	Linekaje
11		Kundapur	Kundapur	Herade
12		Mangalore	Vittal	Dasarakodi
13			Belthangadi	Mundaje
14	Kanara	Sirsi	Janmane	Bandal
15		Yellapur	Nandolli	Magod
16			Mundagod	Malgi
17		Karwar	Anshi	Anshi
18			Hosakambi	Achave

Table -8

Areas under Western Ghats in Different District

S.No	District	Areas included	Land area	Forest area	%
1	U.Kannada	Whole Dustrict except Mundagod tq	871128	720423	83%
2	Belgaum	Khanapur tq only	174922	93964	54%
3	D.Kannada	Coondapur,Karkala,Udupi,Belthangady, puttur, Sullia	707089	235871	33%
4	Shomoga	Sagar, Hosanagar,Thirthahalli tq	457791	123702	27%
5	Chickmagalur	Koppa, Mudigere,Shringeri	217913	43512	20%
6	Hassan	Sakaleshpur	105400	18210	17%
7	Kodagu	Entire District	410775	135654	33%
8	Mysore	H.D.Kote, Gundlupet tq	334745	76847	23%
		Total	3279763	1448183	44%

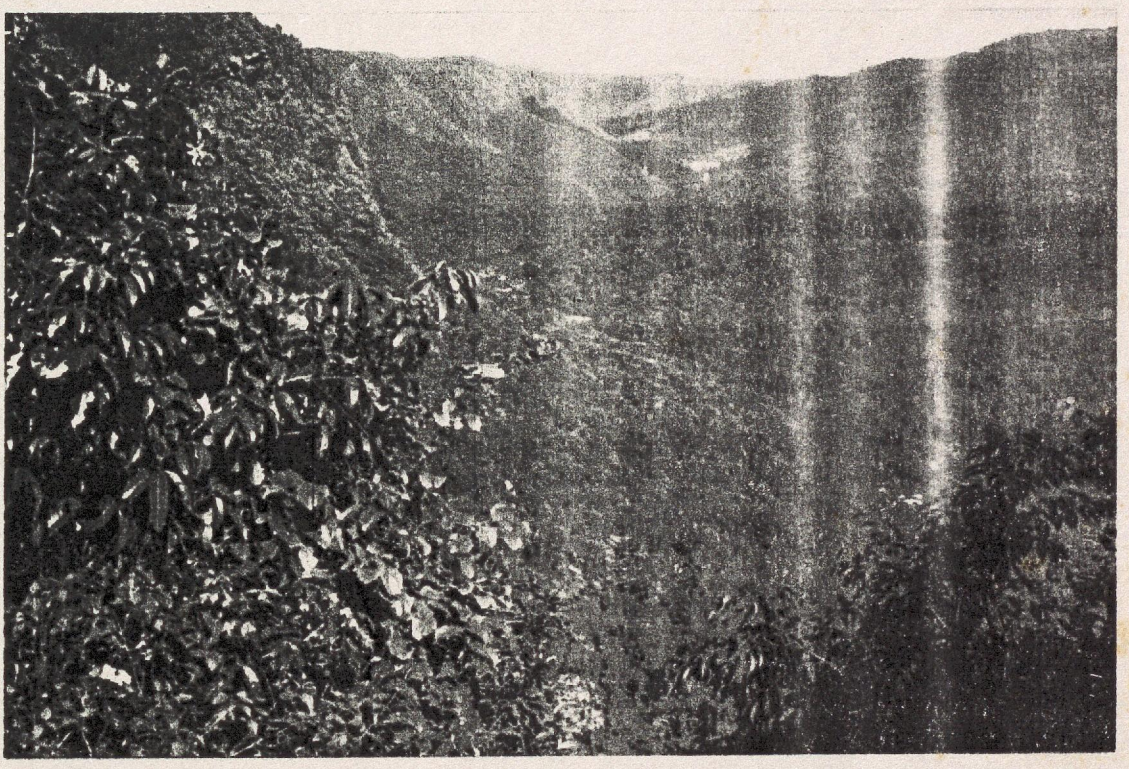

Forest areas in Districts of WesternGhats
Area in ha
1000000
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
U.Kannada
Belgaum
D.Kannada
Shomoga
Chickmagalur
Hassan
Kodagu
Mysore
Dstricts
Land area
Forest area

STUDY OF

NON-TIMBER FOREST PRODUCTS (NTFP)

IN

THE TROPICAL FORESTS OF WESTERN GHATS,
KARNATAKA, INDIA



PRAKRUTI

SIRSI, INDIA

WITH FINANCIAL ASSISTANCE FROM:

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(NC – IUCN TROPICAL RAINFOREST PROGRAMME,
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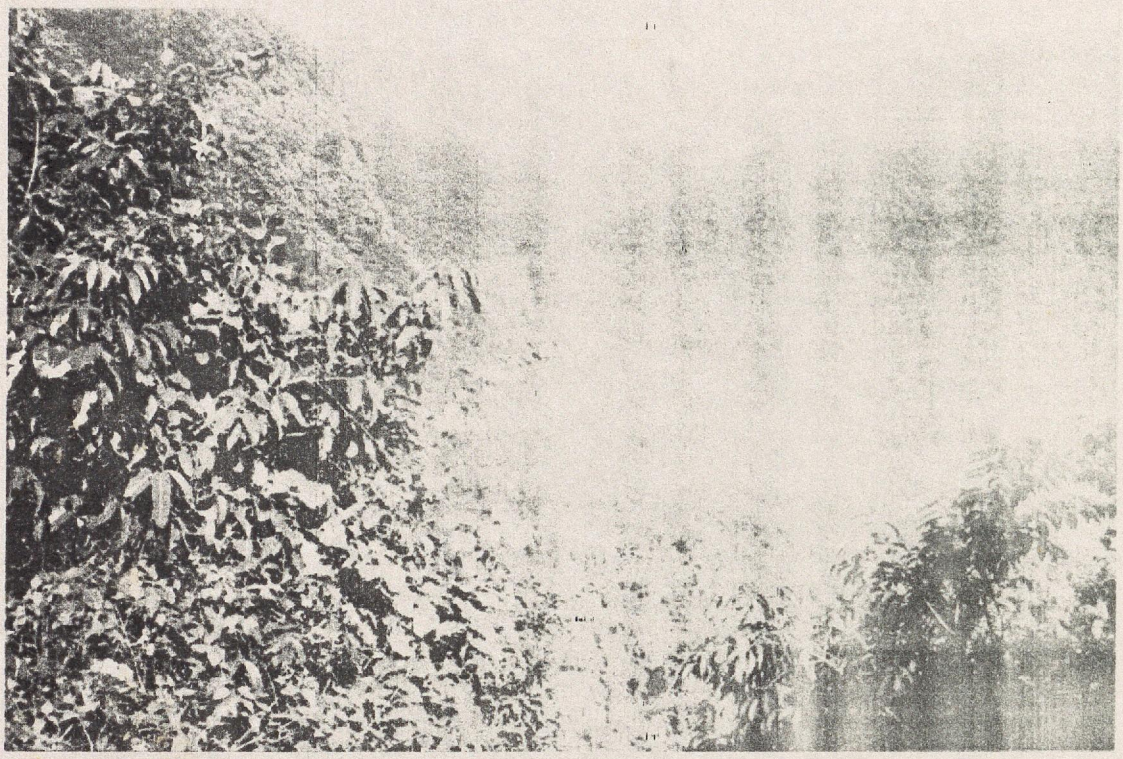
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PROJECT TITLE: (REF AZ 3031 a)

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FINAL REPORT

IMPLEMENTING AGENCY:
PRAKRUTI, SIRSI, INDIA

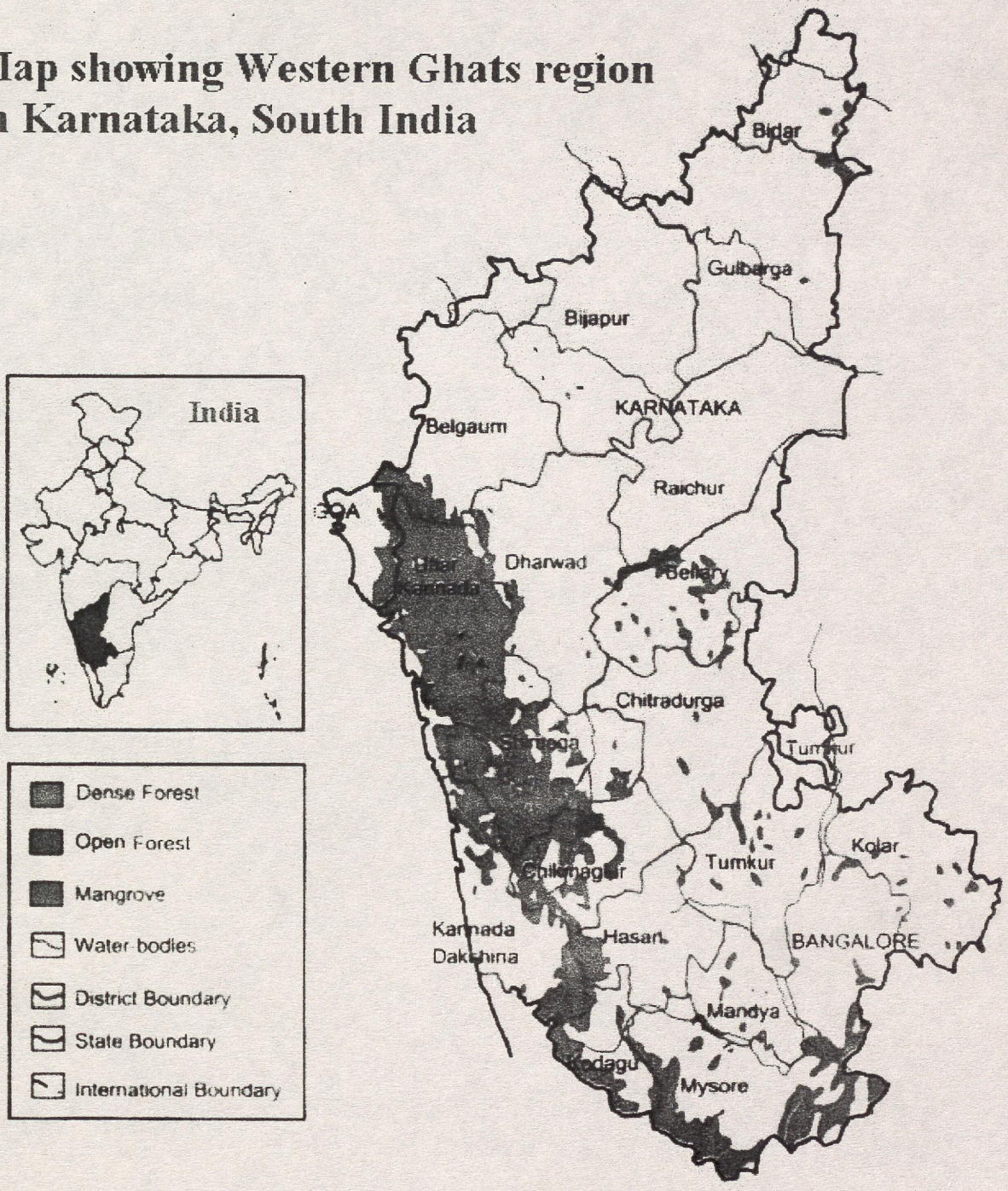
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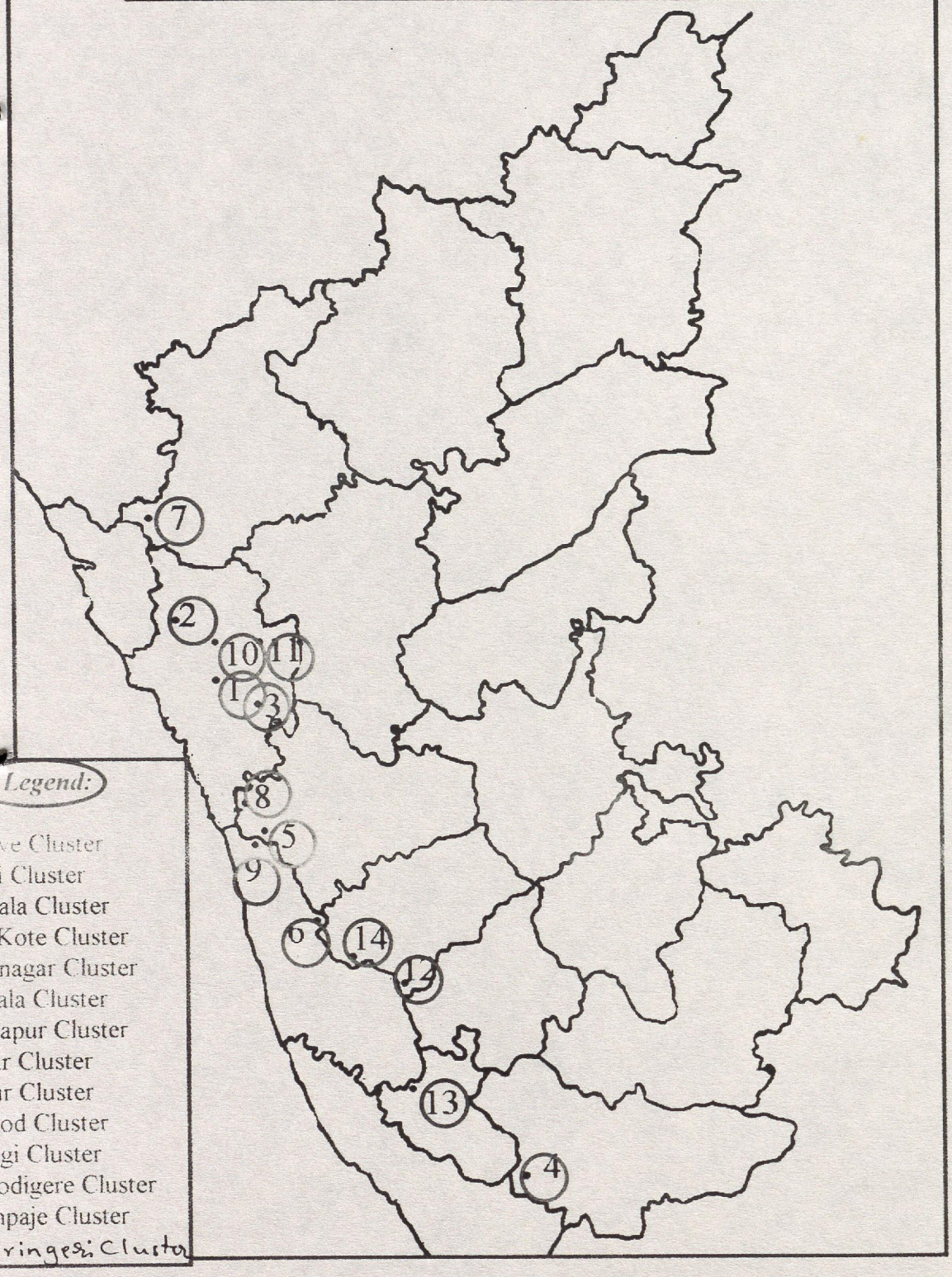
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Map showing Western Ghats region in Karnataka, South India



Map of Karnataka Showing Study clusters



Legend:

1. Achave Cluster
2. Anshi Cluster
3. Bandala Cluster
4. H.D.Kote Cluster
5. Hosanagar Cluster
6. Karkala Cluster
7. Khanapur Cluster
8. Kogar Cluster
9. Kollur Cluster
10. Magod Cluster
11. Malgi Cluster
12. Moodigere Cluster
13. Sampaje Cluster
14. Shringeri Cluster

ACKNOWLEDGEMENTS

It is extremely difficult to acknowledge all the people who have helped to conduct this study. Still, the credit goes to the villagers in the tropical forest of Western Ghats who have patiently listened to our numerous questions on NTFP and for sharing their knowledge. Without their support, this study would not have materialised.

We are also grateful to the NGOS working in Western Ghats for having helped us to conduct the study in their respective areas. Their involvement provided us with a deeper understanding of the NTFP issues from the collectors' perspective.

Karnataka Forest Department (KFD) offices spread across Western Ghats has helped us in collecting secondary data on NTFP. There is growing concern among KFD staff about conserving NTFP resources. They have also actively participated in workshops we organised on NTFP. We sincerely thank them for providing their support.

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April 2000

PRAKRUTI TEAM

EXECUTIVE SUMMARY

- The NTFPs are collected mainly from natural tropical forests. These forests are constantly under pressure and their destruction leads to the shrinking of NTFP resources.
- The commercial forest policy is geared towards monoculture plantations and logging in natural forests. Both these practices are leading towards destruction of NTFP resources.
- The forest dwelling communities are highly dependent on NTFP to meet household needs. However, the use of NTFP for household consumption is decreasing. The knowledge of NTFPs in general and specifically in relation to consumption NTFPs is disappearing at a faster rate
- While income earned from marketing commercial NTFPs can be replaced by alternative employment opportunities, there is no substitute for consumptive NTFPs
- The present policy of auctioning of NTFPs as well as marketing through government supported agencies is causing damage to NTFP resources, leading to overexploitation of the resource and exploitation of collector offering low price.
- The lack of tenurial rights, or property rights is one of the main reasons for over harvesting leading to destruction of the resource. Many NTFP species are under the threat of extinction.
- The market for NTFP is increasing and collectors have also increased, however, the resource base is shrinking providing decreased yields.
- There is very little of value addition done at village level which forces the collector to sell the produce at a low price.
- There is no comprehensive policy on NTFP at state level or at national level.
- The commercial harvesting of NTFPs effects the regeneration of NTFP species. Since the demand is from outside the forest region, and there is high possibility of its increase, the narrow resource base existing in the natural forests is greatly affected. In

addition, importance given to only few highly commercialized NTFPs may lead to the neglect of other species, which will result in loss of biodiversity.

- The resource base of NTFP is limited. Continuous harvesting of these NTFP without any responsibility to conserve the natural resource, affects natural regeneration.
- NTFP resources, if harvested on a sustainable basis provides an opportunity for sustainable management of tropical forests with a regular sources of livelihood for forest-dwellers.

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CHAPTER 1

STUDY OF NON-TIMBER FOREST PRODUCTS (NTFP) IN THE TROPICAL FORESTS OF WESTERN GHATS, KARNATAKA, INDIA

INTRODUCTION

Western Ghats - A Rich Source of Biodiversity:

Western Ghats is considered one of the eight '*global hotspots*' of the world, considering number of endemic, endemic species/area ratios for both plants and vertebrates, and habitat loss. In this region, 0.7 % of global plants and 1.3% of global vertebrates are endemic to Western Ghats. This hill range along with Srilanka supports about 4780 plants and 1073 vertebrate species, in which 2180 and 355 species are endemic respectively. This rich biodiversity of the region comprises about 17.5 endemic plants and 2.9 endemic vertebrate species per every 100 square kilometres. At the same time, this region has lost most of its primary vegetation and now has only 6.8 % of its original vegetation[1](Myers, *et al,* 2000).

Table 1.1 Number of Species and endemism in Western Ghats/ Sri Lanka

Species	Total Species recorded	Endemic species	% endemic to WG
Plant Species	4780	2180	45.61%
Bird Species	528	40	7.58%
Mammal Species	140	38	27.14%
Reptile species	259	161	62.16%
Amphibian Species	146	116	79.45%
Total vertebrate species	1073	355	33.08%

Source: Myers *et al* , (2000)

The Western Ghats comprise a range of hills, covered by tropical forests, starting in the southern portion of Gujarat state (21°N) at the mouth of Tapti river, and running almost parallel to the Indian West coast down to Kanyakumari (8°N) in Tamilnadu in Western India. The length of the Ghats is about 1600 km and average height about 1200 MSL. On the western side, these Ghats fall steeply to sea level and are 4-6 km to over a 100-km from the coastline. The height of these hills varies from 200m to 2600 m. The highest peak is Doddabetta near Udagamandalam in Tamilnadu at 2637 m. (Pascal 1986). The

Western Ghats obstruct monsoon winds, which are responsible for seasonal precipitation in a large part of India, causing heavy precipitation in this area. The tropical heat and heavy precipitation on the slopes of the Ghats cause hot and humid climate ideally suited to plant growth. (Adkoli. 1976)

The Western Ghats in Karnataka, South India:

Location: In Karnataka state, the Ghats start at the border of Goa and run southwards through Uttara Kannada, Shimoga, Dakshina Kannada, Chickmagalur, Hassan, Mysore and Kodagu districts. The highest peaks in Karnataka are Kudremukh Peak (2000m), Bababudangiri, Kodachadri and Pushpagiri. The strip is narrow in Uttara Kannada almost touching the coast and it broadens in the southern part of Dakshina Kannada having a breadth of more than 100kms. (Pascal, 1986)

Rainfall: The annual rainfall in the coastal strip averages 2500-mm. and increases from the coast to the crest of the Ghats. On certain hilltops it is as high as 8000 mm. The rainfall gradually decreases towards the Deccan plateau and reduces to approximately 1000 mm on the eastern tip of the Ghats. (Pascal, 1986)

Forests: The Western Ghats support rich tropical forests.

The types of forest in this region are:

- Low evergreen scrub on the foot-hills
- Semi-evergreen mixed forests on the lower westerly slopes.
- Tropical wet evergreen forests along the upper slopes and valleys.
- Mixed moist deciduous forests on the easterly slopes.
- Dry deciduous forests on the eastern foot-hill and
- Grassy blanks on the higher slopes near the crest of the Ghats occurring as "downs" between wet evergreen forests called "***sholas***" in the protected valleys.

It is of interest to note that 50 per cent of forests of the state lie in this belt and over 70% of productive forests are in this region.

Tropical Wet Evergreen forests cover approx. 4,35,000 ha. The major useful species are *Dipterocarpus indicus*, *Vateria indica*, *Calophyllum tomentosum*, *Poeciloneuron indicum*, *Bischofia javanica*, *Dichopsis elliptica*, *Mesua ferrea*, etc.

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[1] Myers et al, Biodiversity hotspots for conservation priorities, Nature, Vol. 403

Tropical Semi-evergreen Forests cover approximately 1,45,000 ha. The predominant species, are *Artocarpus hirsuta*, *Hopea parviflora*, *Eugenia spp*, *Lophopetalum wightianum*, *Acrocarpus fraxinifolius*, *Machilus macrantha*, *Mangifera indica*, *Canarium strictum*, *Disoxylum malabaricum*, etc. (Adkoli, 1976)

The Moist Deciduous Forests form over 50% of the forest in the Western Ghats and these are commercially rich. The total extent of such forests is approximately 5,00,000 ha. The major species found here are *Tectona grandis*, *Terminalia tomentosa*, *T. paniculata*, *Dalbergia latifolia*, *Lagerstroemia lanceolata*, *Bombax ceiba*, *Grewia telifolia*, *Pterocarpus marsupium*, *Xylia xylocarpa*, etc.

These forests have been partly clearfelled and converted to plantations of Teak (*Tectona grandis*), *Ailanthus malabaricum*, *Bombax ceiba*, *Eucalyptus*, etc. The extent of plantations is approximately: Teak (*Tectona grandis*) 1,35,259ha, *Eucalyptus* 1,34,777 ha, Softwoods 4093 ha, Fuel and Misc. 8,14,906 ha etc with total plantations in Karnataka being 12,24,510 ha. (Annual Report, KFD 1996-97)

Tropical Dry Deciduous Forests form a small percentage on the lower foothills of the eastern slopes. The species found are Teak *(Tectona grandis*), with *Anogeissus latifolia* as its main associate. *Terminalia paniculata*, *Buchanania latifolia*, *Semicarpus anacardium*, *Terminalia belerica*, *Emblica officinalis*, and *Pterocarpus marsupium*

Tropical Low Evergreen Scrub is to be found only in the foothills of coastal taluks of Uttara and Dakshina Kannada Districts. The vegetation is sparse consisting of *Strychnos nuxvomica*, *Careya arborea*, *Emblica officinalis*, and some thorny shrubs like *Carissa carandas*, *Zizyphus oenoplia* etc.

Grassy Blanks along the crest and on the upper slopes of the Western Ghats are fairly extensive and their ecology is very complicated. The vegetation consists of coarse grass only. These grasses are climax vegetation co-existing with the *sholas* or low evergreens in the protected valleys. Colonisation of grassy blanks is visible only as a narrow belt of 5 to 1 m around the *sholas* by species of *Strobilanthes*. The extent of these grassy blanks is not correctly known. A fair estimate is that they are approximately over 30,000 ha. (Adkoli 1976)

Justification for study:

Importance of NTFPs in conservation of tropical forests: There is a growing concern for conservation of tropical forests throughout the world. This conservation aspect of forests has three major dimensions /views. These are economic, environmental and livelihood issues of the forest dependent communities living in these region. NTFPs are the important resources worth conserving, considering all the dimensions.

Over the last 2 decades, the poilcy makers have been looking at tropical forests from the economic and environmental point of views. However, the third dimension, *the view of forest dependent communities,* living within the forests was under estimated. NTFP is inter-linked with their day to day life.

Tropical forests not only provide the raw materials for conventional forest products such as structural timber, veneer, and firewood, but they are also the source of food, fodder, medicines, resins and shelter for millions of people. These tropical forests have been a food-basket for millions of people, and their plants are medicines for number of people on this planet with its finite capacity to provide for men's needs and advances in technology that are coupled with an attitude of resources, especially on the tropical moist forests (Francois Oergen, 1987). A large part of the rural population particularly those inhabiting areas close to forests depend on NTFP both for subsistence and income generation. Apart from fulfilling subsistence needs in terms of food, fuelwood and fodder requirements, NTFP generate at least half the employment in the forestry sector (Pachauri and Rashmi, undated). It has also been found that the dependence of poorer groups in the community on NTFP is particularly high. Since many NTFP are available through out the year, their collection provides an important fallback in a situation of rainfed agricultural cultivation with limited sources of employment. In addition, they can be harvested at optimum levels without damaging the forests, adversely affecting their future yield.

Along with their environmental functions, these forests support livelihoods of thousands of people living in this region. Tribal communities like *Kunbis, Siddis, Jenu Kurubas, Betta Kururbas, Kudiyars, Kharevokkals* and *Soligas* have been living in and around forest along with the mainstream population. There is a complex relationship between these tribal communities and forests. They have been using the diverse forest resources for food, shelter and also to cure common diseases. These forest products are commonly

termed as Non-Timber Forest Products (NTFP) and have great importance in food security, livelihood, and employment for the local people.

In many areas collection of NTFP is one of the main sources of cash income and regular employment for people who are living in and around the forest. The land holding in Western Ghats is very small and marginal and the wild diversity is a source of security that provides cash income to the poorest groups. In addition to harvesting of NTFP, the indirect activities associated with it, like collection, distribution, marketing etc., employ a large number of people. Increase of monoculture plantations by afforestation programs, has reduced the ecosystem diversity and hence the yield of NTFP.

NTFP is largely available in the tropical forests. As the harvesting period is short and demand for NTFP high, people want to collect as much as possible in the shortest time. Thus they resort to highly destructive harvesting methods like lopping the branches or cutting down the entire tree itself. In the tropical forests of Western Ghats, the diversity has been reduced due to this pressure and some trees are on the verge of extinction. e.g. Cinnamon (*Cinnamomum sp*) , *Uppage* (*Garcinia gummi-gatta*)

The collection is done on a small scale in the village. At times the entire family, including children may be involved in the collection and processing of NTFP. The benefits and the capacity to process (drying etc.) and store the material are limited. The process of drying the rind of fruits also consumes a lot of wood. According to a Karnataka Forest Department estimate, 25 kg of dry wood is used to dry 1 kg of rind of *Uppage* (*Garcinia gummi-gatta*) (Saibaba 1996). Thus, collection of some of NTFP for commercial purpose may affect forest ecology both directly and indirectly.

Marketing is the biggest hurdle in utilising the NTFP. Middlemen and the contractor control the entire marketing though the forest department allots NTFP on tender basis. The pressure of storage, collection, harvesting and constant need of finance forces the forest dweller to sell his produce at a cheap rate to the middlemen. There are few people who get enormous money from NTFP and the people who toil to harvest them remain poor, without proper share from the benefits. The exploitation process gets reinforced, leading to social injustice among people.

The harvesting of NTFP is a major source of employment during a part of the year. It also helps people to earn the much-required cash. The availability of NTFP is dependent

on the wild diversity of the region. However, in recent years the greed to earn more money and make more profit has destroyed the diversity and has reduced the yield of NTFP.

In some parts of the region, particularly in the tribal rich areas of Mysore and Madikeri, marketing is carried out mainly through LAMPS (Large-scale Adivasi (tribal) Multipurpose Society), a co-operative society of tribals.

The increased pressure to harvest maximum quantity from the tropical forests has led to reduction of the resource base of NTFP. The examples are *Uppage (Garcinia gummi-gatta)* and Dhoopa (resin from *Vateria indica*, *Boswellia serrata*, *Canarium strictum*). People cut the trees to harvest more, thus reducing the chances of natural regeneration. Thus, the second-generation trees do not exist in the wild. Today most of the species having high commercial price are threatened. A time may come when these species may get extinct.

All these factors lead to destructive ways of harvesting of NTFP. The research project aims to understand the deeper issues involved in NTFP that will help in formulating a strategy for sustainable harvesting of NTFP and ensure that the poorest groups of forest dwellers get some benefit. This is one of the ways to enhance the biodiversity of the region.

Extensive logging of tropical forests of Western Ghats for timber resource and to earn revenue has adversely affected the NTFP resource. NTFP is a major resource in the tropical rainforest region that has enormous capacity for sustainable harvesting with additional advantage of generating employment. Forest dwellers who collect NTFP are not organised. There are no proper marketing or value addition channels to NTFP. Even though, NTFP provides substantial and critical contributions to the cash income of forest dwellers, the income derived from the products barely matches the minimum wages from the other occupations (Hegde *et al* 1995). Hence it is necessary to organise forest dwellers for sustainable harvesting and marketing.

There is no clearly defined government policy on NTFP. NTFP is constantly over exploited. There is an urgent need to evolve policy towards sustainable production of NTFP. Logging for timber has adverse effects on the tropical forests as it reduces the availability of NTFP affecting the livelihood of forest dwellers. There is an urgent need

to identify the cause for its over exploitation and to involve collectors of NTFP in sustainable harvesting and conservation of natural resources. This study aims to cover all the above mentioned areas and provide a database cum action strategy on NTFP for the tropical forests of Western Ghats.

Objectives:

The three main objectives of the study are:

1. Study of NTFP available in the tropical forest region of Karnataka.
2. To develop indicators for sustainable harvesting of NTFP.
3. To organise NTFP collectors (forest dwellers)

With all the talk of sustainable development and retaining ecological balance, what needs to be looked into is, the dependency of the people at this juncture, on NTFP, (in relation to the past) and what kind of changes are taking place in the resource base itself, due to the use of forest products. It is disturbing that many species, once commonly available, are increasingly becoming rare. It is a common complaint voiced by local communities (particularly craftsperson's) that species commonly available earlier are fast disappearing. This is due to the degradation of forests and the overwhelming emphasis given to monoculture of commercially valuable and/or fast growing species in the name of scientific forestry. The crucial role of NTFP in the lives of local communities needs to be recognised. It is only when they have say in forest management practices that the current situation can be reversed, for they will then seek to ensure that those diverse species important in their lives are protected and grow.

One of the objectives of this study is to document all the available species and their uses in the study areas. They will then be placed in the context of the role they play in the lives of the forest dwelling communities. Here, it is to be noted that we will try to focus on the use values rather than the commercial values, which have unfortunately been given undue prominence in the past. To examine these adequately, we will of necessity have to investigate these forest-based cultures, particularly their knowledge systems. Finally, we will cast a look at the strategies for protection and regeneration of NTFP species under threat from high extraction pressure.

CHAPTER 2

DEFINITION AND CLASSIFICATION OF NTFP

Historically, NTFP is a collective name given to all the produce other than timber because during the British period when scientific forestry started in India, only timber was of major economic importance. Hence the loose definition, which prevailed, at that point of time categorised only timber as major forest produce and all other forest products were clubbed together as minor forest produce. However, with the passage of time these products gained importance and graduated into economically major ones and at present these have been termed as Non-Timber Forest Produce (NTFP) as it would be a misnomer to categorise them as minor forest produce. It is worth noting that India has a wide array of forest products derived from over 3000 species of plants apart from a large number of animal and mineral products. (GOI – NTFP committee report 1998)

The Indian Forest Act, 1927 defines 'forest produce' but there is no mention of the term 'minor or non-timber forest produce' in the Act. Section 2 of the said Act defines 'forest produce' as follows: -

" a) The following whether found in, or brought from, a forest or not, that is to say,-

Timber, charcoal, caoutchone, catechu, wood oil, resin, natural varnish, bark, lac, mahua flowers, mahua seeds, kuth and myrobalams, and

b) The following when found in, or brought from, a forest that is to say, -

- trees and leaves, flowers and fruits and all other parts or produce not herein before mentioned, of trees;
- plants not being trees (including grass, creepers, reeds and moss) and all parts or produce of such plants;
- wild animals and skin, tusks, horns, bones, silk cocoons, honey and wax and all other parts or produce of animals, and
- peat, surface soil, rock and minerals (including limestone, laterite, mineral oils and oil products of mines or quarries);

- The Act defines 'timber' as: "timber includes trees when they have fallen or have been felled and all wood whether cut up or fashioned or hollowed out for any purpose or not".

The Act also defines a 'tree' as follows: "Tree includes palms, bamboos, skumps brush wood and canes."

A perusal of the Act and as quoted above, reveals that 'timber' includes 'bamboo' and 'cane'. (The Indian Forest Act, 1927)

It is interesting to note that in a letter to Shri Vishwanath Anand, Secretary, MoEF, the Secretary, Ministry of Rural Areas and Employment (D.O No.N-11011/14/97-PR) suggests that "all twigs and branches and all Non-Wood Forest Products including bamboo be termed as MFPs and that the Indian Forest Act be amended to include this definition and that pending such an amendment a clarification be sent to all the state governments." For the purposes of this report, we have treated bamboo and cane as NTFP. The committee set up by the MoEF to examine the implications of conferring ownership rights of MFPs on panchayats and gram sabhas (to be termed Chadha committee in this report) has also treated bamboo as MFP. This commitee goes on to define MFP as follows:

"Minor Forest Produce is the forest produce, other than timber, harvestable on a non-destructive basis" The term 'forest produce' and 'timber' will have the same meaning as in the Indian Forest Act, 1927.

The glossary of technical terms published by Forest Research Institute, Dehradun; the 4th World Forestry Congress held at Dehradun (1954), FAO, IUFRO and COMFORPTS etc. have also addressed the issue but their efforts have been limited to classification and documentation of such produce without actually defining the term NTFP. After the enactment of Panchayats (Extension to the Scheduled Areas) Act, 1996 (PESA, 1996), many states have attempted to define the term NTFP, without much success. The Act, however, has not defined the term NTFP. [GOI – NTFP committee report]

As far as the state of Karnataka is concerned, the term 'minor forest produce' has been defined in the Karnataka Forest Act, 1963 as "forest produce other than timber, sandalwood, firewood, charcoal, bamboos and minerals, and includes forest produce such as myrobalams, barks, fibres, flosses, gums, resin, dyes, grass, leaves, roots, fruits, seeds,

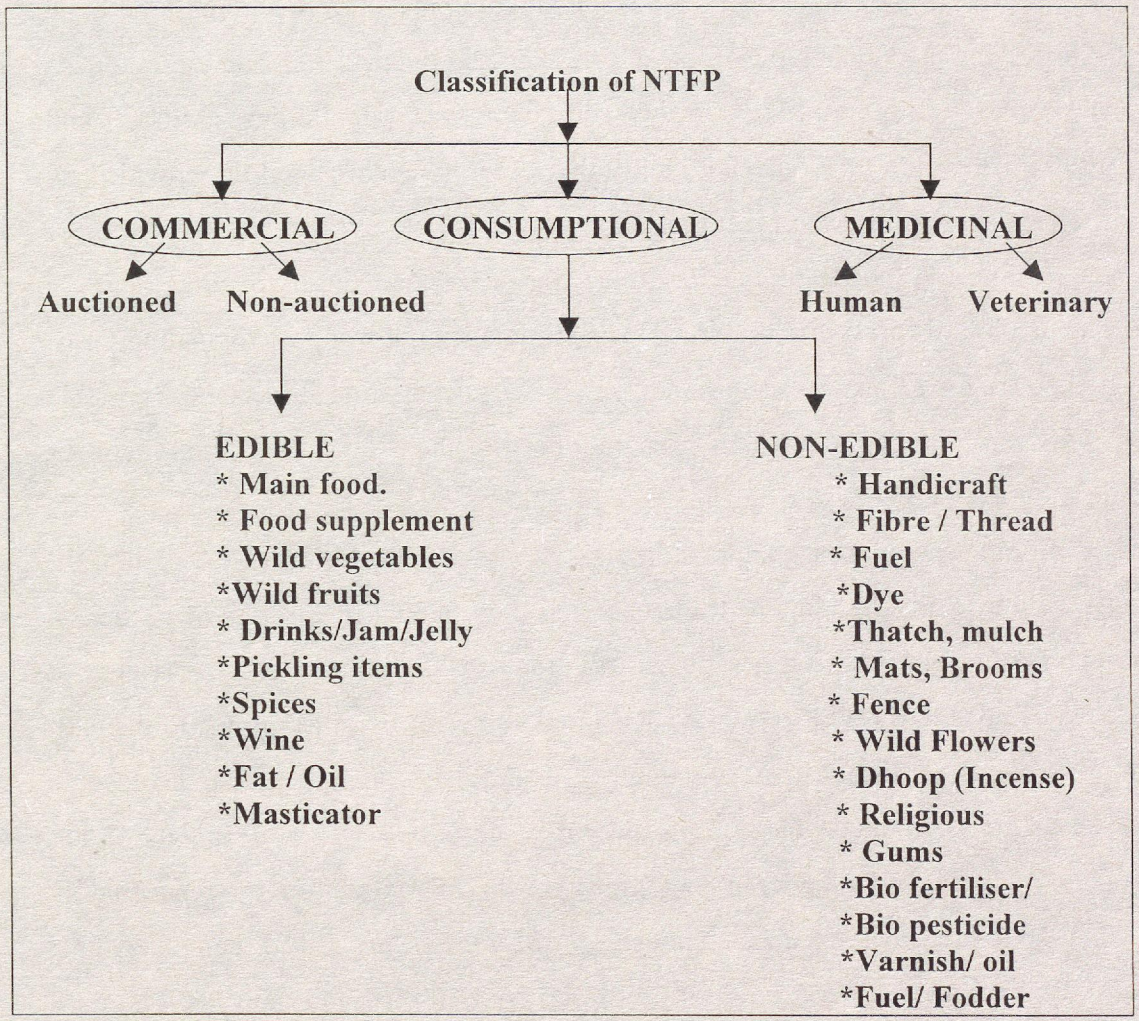
creepers, reeds, moss, lichens, wood-oil, honey, wax, lac, wild animals, wild birds, *rophys horns*, hides, bones, tusks, etc. [Karnataka Forest Act, 1963]

The definition that has found international use is:

"Non- Wood (Timber) Forest Products include all goods of biological origin, as well as services, derived from forest or any land under similar use, and exclude wood in all its forms" (Chandrashekharan 1995).

CLASSIFICATION OF NTFP:

NTFP have been broadly classified based on the relevance and mode of relationship to survival of local communities as 1) commercial 2) edible, 3) non-edible and 4) medicinal. (Malhotra *et al,* 1991).



Commercial NTFP are those collected and sold by the locals mainly to earn money for sustenance or as a secondary source of income. Edible NTFP are all those which constitute a major source of nutrition, that the local populations collect for themselves or

for their livestock as food. These NTFP are hardly sufficient as sources of livelihood, except for a few items that may be sold due to seasonal abundance. Non-edible NTFP, on the other hand, constitute all those parts of plants or animals which are used by locals for purposes other than food. Medicinal NTFP is a self-explanatory category. It needs to be borne in mind that such classifications are fraught with difficulty and lacunae. Primarily, this looks at NTFP from a collector's perspective, neglecting the collector-user or user-collector.

REVIEW OF LITERATURE: Non-Timber Forest Products (NTFP) give substantial inputs into the lives of a large number of people in developing countries and their production and use can constitute one of the main demands placed upon the forest resource. A complete understanding of the NTFP situation is therefore central to both the task of conserving and managing tropical forests, and of ensuring that these forests continue to contribute appropriately to the welfare of local populations. (Michael and Perez, 1996). The value of biodiversity and other environmental functions provided by tropical forests, increased awareness in use and sale of NTFP and its contribution to the household income and food security have all lead to increased attention towards NTFP.

Though collection of forest products like NTFP for consumption and medicinal purposes has been known for a long time, their collection, uses, economic importance, possible role in food security, and value addition has not been studied. There is limited literature available about NTFP in Western Ghats region.

Scientists of Tata Energy Research Institute, Bangalore, conducted one of the first NTFP studies in Biligiri Rangana Hills of Karnataka and they published a series of papers on NTFP. The first paper in these series, on contribution of NTFP to rural income (Hegde at al, 1995) concludes that NTFP provides substantial and critical contributions to the cash income of Soligas (a local tribal community). They also concluded that the income derived from the products barely matches the minimum wages from the other occupations. The second paper, on the impact of NTFP extraction on regeneration, population structure, and species composition (Murali *et al,* 1995) concludes that regeneration is affected by collection of seeds and fruits from NTFP species. The third paper in these series on productivity, extraction and sustainable harvest of *Emblica officinalis* (Nelli) concludes that the extraction of NTFP is having negative effect on new

recruitment in the population. However, adequate control and management in harvesting NTFP can enhance rural incomes and contribute to biodiversity conservation. The fourth paper on fuelwood pressure and management options (Uma Shankar, *et al* 1996) concludes that collection of fuelwood affects biodiversity.

Janapara Vijnana-Tantra Jnana Samsthe (J.V.S) Dharwad, has done an important piece of work on NTFP in Uttara Kannada in Yellapur and Haliyal talukas both of which lie in the north of the district. The study was conducted in the region of forest type, - moist deciduous and dry deciduous, with some patches of semi-evergreen in one village. The study examines the relation of forest dependent communities with forest products. Another important study was done by the Institute of Social Studies Trust (ISST), Bangalore (1987). This study concentrates on collection of *Uppage* (*Garcinia gummigutta*) in Sirsi and Siddapur taluk. The case study focuses on the nature of participation of different groups, especially of village women in this trade and on the requirements of each of these groups. The detailed report gives information about the collection, processing, and marketing methods of *Uppage* (*Garcinia gummigutta*) in this region.

A study about Minor Forest Products (NTFP), in Sirsi and Honnavar division, was done by Eco Consultants, Bangalore (1996). This study lists the NTFP species available in these two divisions, under the category of food, wild fruits, medicinal herbs, oil/nuts, cane, bamboo, fiber etc. However, the list is not complete and also the uses of NTFP are all collected from secondary sources. There is greater importance given to commercial NTFP, rather than consumption NTFP.

The study by P.B. Karunalkar (1996), about collection of Harda *(Terminalia chebula)* – case study, in Jagalbet Range, focuses on benefits of marketing of Harda *(Terminalia chebula)* through V.F.C. (Village Forest Committee) over the present system of giving contract to the highest bidder. This study concludes that, the right of collection of Harda *(Terminalia chebula)* through V.F.C. has been beneficial to the villager and there is need for extending the collection rights to other NTFP. (Karunakar. 1996)

However, neither of these studies bring out a clear picture of NTFP available in entire Western Ghats of Karnataka nor does it throw light on NTFP that is part of the rural life that take care of many myriad needs.

CHAPTER 3

RESEARCH METHODOLOGY

The study used the cluster approach to obtain data from the different eco-zones/parts of the region. This approach was decided upon mainly to retain the diversity of the various species of NTFP and the different communities that we attempt to study. The cluster approach gives enough space to include most of the communities that are spread across the region and provides a chance of studying the variations in usage of NTFP. In each cluster about eighty families (forty each from two villages) were selected considering the representation from the caste/community and eco-zones.

Fourteen clusters of villages were selected for this study to cover the different eco-zones and communities.

The study techniques used for collecting data from the field:

Records: Secondary data was obtained from the forest department and other sources like Revenue departments, *Panchayaths,* regarding out put (product, quantity, revenue) of NTFP available in Karnataka, total geographical area, forest area, forest type, agricultural area, total population of the village, caste composition, land holding and general information etc.

Field study: Field study was done using mainly two methods viz., Questionnaire and PRA (Participatory Rural Appraisal) methods.

Questionnaire method: Pre-planned questionnaires were used to obtain information about the socio-economic status of the families chosen for the study. Questionnaire was composed of three parts viz., **Socio-economic** details like income, literacy, possession of luxury items etc were collected from first part of the question. In the second part **details about NTFP collected**, consumed in house, sold outside etc were collected. Besides, information about price earned by selling NTFP, marketing channels, consumptional NTFP, medicinal NTFP etc were also collected. In third section, **answers were obtained for questions about processing details, suggestions for conservation, problems faced by collectors** while collection, marketing, alternative marketing channels etc. These questionnaires were filled by the local field assistants.

Even though the questionnaire method has some advantages, it is limited to some specific

questions only. However, to collect more information, like historical aspects of collection, marketing, processing and uses of NTFP, and to collect mass opinion some more methods were used.

PRA method: PRA Techniques were effectively used for collecting information about NTFPs in the village, from forest dwelling communities. The limitations met in questionnaire method were effectively tackled by PRA method. In case of PRA, we can extend it to any research questions. Besides, we can cross check the data obtained by other scientific methods, from another 'angle'.

PRA methods like Venn diagram, inflow - out flow of resources, historical transact, resource mapping, Focus group Discussion, were used to collect information.

Research team visited the village on the date previously decided by the local field assistant after consulting the villagers. Villagers were informed in advance. Wherever possible, research team visited the village a day before the actual PRA to gain the confidence of villagers.

It is tried to collect a gathering of maximum villagers representing all sections of the society, including men, women, and children. Information was collected using following tools as key methods.

A few tools of participatory appraisal that are used are listed below. This is not an exhaustive list by any means but is used as a directive while collecting data in the field.

1) Inflow-outflow chart: Using this method information about the availability {inflow} of NTFP in the study area and the use {outflow} of the same was collected. The method helped to find out the various ways and extent of processing that the consumptional and commercial NTFP undergo before being used by the collector or the external consumer.

2) Ranking and scoring: This is used to get information about the how local resources are valued and managed. The information generated by the wealth ranking is also helpful in selection of informants in such a way as to offset the bias the inherent in different prospective. Matrix ranking used to investigate the various values, which a group attaches to particular resources. It revealed both the use and non-use values and their relative importance. Matrix ranking involves asking the group of informants about the useful qualities of various items. The items being discussed and criteria for judging them were put into the matrix or table and the informant can rank the item according to the

criteria.

3) Resource mapping and transacts walk: This method helped in listing out the various species of NTFP that grow in the area. Transact walk helped in collecting information about the status of NTFP in different period. Further discussions on this gave answers to issues like why some species have gained importance while some of them are no longer used or depletion of some species.

4) Venn diagram: The method used to demonstrate clearly the NTFP with multi-purposes uses i.e., to say it helps to list out those NTFP which come under more than one category be it commercial, consumptional or medicinal. Venn diagram is also used for documenting views of forest dwellers about quantity wise and income wise importance of NTFP.

5) Seasonality map: This method is used for collecting information about the availability and quantity of NTFP in different seasons.

PRA is a creative and adoptive information system, which is based primarily on the information, needs of the insiders. This process is to get unbiased information from the population being studied. In practice, this means that, the views and opinions of local information are paramount and should be understood. In other words, PRA is a method of determining "insider point of view".

To get more information about the village research team visited some of the important NTFP collectors, old persons and interviewed them.

The study used the comparative analysis method to bring out the clear differences between the extent and type of NTFP used by various communities and how their socio-economic and cultural realities influence the availability and use of NTFP. The selected families were studied in detail about the types of NTFP collected by them during different seasons, the quantity consumed by the household and sold for cash. In addition, the informations about the NTFP having importance in sustenance needs are collected.

Objectives of the study are achieved using above PRA tools linked to output as below:

Table 3.1 *PRA Tools*

	Objectives	PRA tools	Output
1	Inventory of NTFP species	Resource map Transact walk	List of NTFP, Forest type, Type of ownership
2	Classification	Venn diagram	Classification map of NTFP with different use pattern, application, parts used
3	Seasonality	Venn diagram	Seasonality calendar Seasonality calendar with magnitude
4	Availability (quantity)	Venn diagram Trend line matrix ranking Transact walk Resource map Charting	Availability map (Quantity wise) Changes in availability of NTFP Matrix scoring of NTFP in study area in view of availability Village resources with quantity Product flow chart
5	Importance (which is the resource important to collector)	Venn diagram Trend line Ranking and Transact walk Resource mapping	Importance of NTFP Changes in use pattern Village resource map with economic importance Comparative product Ranking.
6	Impact of collection on ecology	Trend line Transact walk	Changes in availability/collection pattern Degradation/change of Eco system.
7	Impact of NTFP collection on economy of Forest Dwellers	Trend line (Quantity) (Income)	Changes in Economy of collector. Changes in quantity of NTFP.
8	Dependency on Forest products	1)Trend line a) Quantity b) Income	Changes in collection of NTFP.
9	Market	Trend line	Variation of Market price Sold price and net margin enjoyed by person in marketing chain
10	Gender and NTFP perspectives	Time line (Daily activity schedule) Venn diagram Pie chart	Role of women in NTFP collection processing, and sharing of benefits Daily activity schedule- Time line Trend line
11	Collection and processing method		Documentation of collection and processing practices Trend line of NTFP collection
12	Background information about village	Historical transact	Ecological History of the study site

SELECTION OF RESEARCH ASSISTANTS:

The study is conducted based on data obtained from fourteen cluster villages that cover the different eco-zones. A group of fourteen research assistants was selected in order to collect this required data. These research assistants were individuals who belong to the respective clusters, well aware of the social, cultural, religious, economic and other societal dynamics of the area. They have a basic understanding of the issues regarding NTFP as they have grown up in the same environs and have seen and heard of the changes that have taken place over the years regarding the dependency of their families on NTFP. They have also assimilated the views and opinions their people have about the changes in forest laws, its impact on their lives (irrespective of its degree) and the subsequent adjustments and changes that people have made in their own lives. Another reason for choosing research assistants from the same areas was also to ensure obtaining of authentic and true data. It was foreseen from the experiences of previous researchers that individuals often think that the information obtained from them will be used against them or that it will be divulged to the Forest department, which will put them into trouble unnecessarily. So they are hesitant and sometimes refuse to answer questions or participate in discussions. It is expected that this problem will not arise when it is their own people asking them questions and the research assistants will be in a better position to explain to them the needs and objectives of the study and also answer their queries about the study itself. Another intention of the study was to select women assistants as far as possible to facilitate an understanding of the gender perspective of the issues of NTFP. Since the study considers that cosumptional and subsistence NTFP are as important, if not more, as commercial NTFP; it was felt that the women would feel more at ease speaking to women researchers. However, practical difficulties such as long and odd hours of data collection, requiring travelling through forests and between villages made it difficult to find an all-women team. The study now comprised of five women assistants out of the fourteen.

SELECTION OF CLUSTERS

The following could be stated as the main criteria for the selection of clusters for the purpose of the study.

1) The number of communities living in that cluster: The study seeks to understand the use and importance of NTFP in the lives of a cross-section of communities in Western Ghats and also the different ways in which they are used, which is, very often, culture-specific.

2) The eco-zones: Clusters belonging to different Eco-zones show variation in the type of forest and the availability of NTFP. Type of forest changes from evergreen to dry deciduous from one cluster to another cluster and hence the type of NTFP species also. For e.g. *Uppage* is the major commercial NTFP in Bandala (evergreen forest) cluster, which is not at all available at Malgi (dry deciduous) cluster. Even most of the consumption NTFP that are used in one cluster is not available in another cluster.

3) Availability of data regarding the area: The clusters chosen comprise of areas, which have been only minimally exposed to research studies in the previous years. A conscious attempt has been made to avoid repetition of data collected or areas studied by other researchers. This way we hope that this study will add on to the knowledge base regarding the forests of Karnataka and its relationship with the people.

4) Intervention by NGOs: Clusters chosen include areas where NGOs have been working (not necessarily with issues of NTFP) as well as those areas which have not been exposed to intervention by 'external' groups.

5) Specific characteristics of some areas were also taken into consideration while forming clusters. For e.g. in the Anshi cluster there exists the system of tenurial security i.e. every NTFP collecting family has rights over specific collection areas and no other family can collect NTFP from that area. The special characteristic of Magod cluster is the hunting of small animals by the communities living there for the purpose of their own consumption needs.

We have selected 14 clusters of villages in the State, considering both ecological and sociological aspects as mentioned earlier.

Table 3.2: The study Clusters in Western Ghats of Karnataka:

S. No	Forest Circle	Forest Division	Range	District	Taluk	Name of the Study cluster
1	Shimoga	Sagar	Kargal	Shimoga	Sagar	Kogar
2	Shimoga	Hosanagar	Nagar	Shimoga	Hosanagar	Hosanagar
3	Shimoga	Chikmagalaur	Moodigere	Chikmagalore	Moodigere	Moodigere
4	Shimoga	Koppa	Shringeri	Chikmagalore	Shringeri	Shringeri
5	Belgaum	Belgaum	Khanapur	Belgaum	Khanapur	Khanapur
6	Mysore	H.D.Kote	Saragur	Mysore	H.D.Kote	H.D.Kote
7	Kodagu	Madikeri	Sampaje	Kodagu	Madikeri	Sampaje
8	Kodagu	Kundapur	Karkal	Udupi (D.K)	Karkal	Karkal
9	Kodagu	Mangalore	Kollur	Udupi	Kundapur	Kollur
10	Kanara	Sirsi	Janmane	Uttara Kannada	Sirsi	Bandala
11	Kanara	Yellapur	Nandolli	Uttara Kannada	Yellapur	Magod
12	Kanara	Yellapur	Mundagod	Uttara Kannada	Mundagod	Malgi
13	Kanara	Karwar	Anshi	Uttara Kannada	Joida	Anshi
14	Kanara	Karwar	Hosakambi	Uttara Kannada	Ankola	Achave

STUDY AREA

In Karnataka, the Western Ghats (Latitude 11°31 to 16°45, Altitude 73°45 to 76°40) span the districts of Belgaum, Uttara Kannada, Dakshina Kannada, Shimoga, Chikmagalur, Kodagu and some parts of Hassan and Mysore, all of which are part of the study.

Uttara Kannada District: Situated on northern side of the state, the district has more than 60 % of its land under thick forest cover. The district is bordered by Goa to the North, and the Arabian sea to the west and has four distinct geographical zones viz., coastal strip in the west, crest line of Western Ghats, middle hilly region of the Ghats and the eastern plains. Accordingly the district is represented by, all the Western Ghats forest types. The forests are under the administration of the Canara circle, having its head office at Sirsi.

Forest types include Coastal scrub, Tropical evergreen forest in the foot hills and crest line of the Western Ghats, Moist Deciduous Forest, and Dry Deciduous Forest. All these types support a number of NTFP species.

Belgaum: Only Khanapur taluk of Belgaum District is part of the Western Ghats. Bordered by Goa to the west and Uttara Kannada district to the south, the area supports tribal communities like Kunbis and Marathas. Khanapur, Nagargali, Kanakumbi, Londa, and Golihalli are the forest ranges that are part of the Western Ghats.

The area is covered by Moist and Dry Deciduous types of forests. Except for Londa Range, some of the areas were converted into monoculture plantations of Teak during colonial period itself.

Dakshina Kannada: A district with a narrow coastal strip, which runs parallel to the Arabian sea, but broadens to as much as 100 km in the southern part. Being one of the highly populated districts of Karnataka, it has natural tropical forests only in areas nearer the foothills of Western Ghats. Recently the district was divided into two districts viz., Udupi in north and Mangalore in the south. The forests of these two are under the administration of Kundapur and Mangalore forest Divisions respectively, in Kodagu Forest Circle.

The type of forest that can be seen in the District is coastal scrub and tropical evergreen in foothills of Western Ghats.

Shimoga: Situated in the higher altitudes of Western Ghats, the District hilly with plains to the East and eastern plains. Sagar, Hosanagar, and Thirthahalli taluks of this District are part of Western Ghats. The forests of this district are under the administration of Shimoga circle. The forest divisions under Shimoga Circle are Sagar and Shimoga in Shimoga District; and Koppa and Chigmagalore of Chikmagalore District.

The types found in the District are mainly Evergreen, Moist Deciduous and Dry Deciduous forests. The District has almost all the NTFP species that are found in these forest types.

Chikmagalur: The District is situated south of Shimoga, and has undulating hills and is at a higher altitude than the above Districts. Bababudangiri is the highest peak in Western Ghats of Karnataka at 1900 m. Naturally, the District is less tropical than the above Districts. Coffee is the major commercial and popular crop, growing here. Stringer, Chop, Muddier, are the taluks situated adjacent to the crestline and Narasimharajapur taluk is in the middle of the District. The Taluks, which are adjacent to the crestline, have evergreen type of forest whereas Narasimharajapur taluk has dry deciduous type of

forest. Administration of these forests is under Koppa and Chikmagalur Divisions of Shimoga circle. Evergreen and deciduous type of forests are found here.

Kodagu: Kodagu District bordered by Kerala to the south, Dakshina Kannada to the west, and Mysore to the east has a highly undulating terrain. The rich forests here have been converted into coffee and a few cocoa plantations. The District has three Taluks. The forest area is under the administration of Kodagu Circle.

The District has evergreen type of forest mainly on the western side with areas like Brahmagiri in the south and Pushpagiri in the North. To the east are dry deciduous forests. Moist deciduous types of forest are found in areas like some parts of Rajiv Gandhi (Nagarhole) National Park.

Hassan: Only Sakaleshpur Taluk of this District is part of the Western Ghats. The Eastern part of this taluk has been converted into plantations; while the western side still has thick tropical evergreen forests near crestline of Western Ghats.

Forest type is mainly semi evergreen and wet evergreen in the crestline area and small patches of Moist Deciduous type of forest around Sakaleshpur.

Mysore: The District is situated in the southern most part of the state. Separated by a belt of thick Moist Deciduous type of forest, from Tamilnadu and Kerala. This forest constitutes three major wildlife sanctuaries, viz., Madhumalai, Nagarhole and Bandipur.

Type of forest commonly found is Moist and Dry Deciduous type.

Table 3.3 Areas under Western Ghats in Different Districts of Karnataka

S.No.	District	Areas (Taluk) included	Land area in acres	Forest area in acres	%
1	U.Kannada	Whole Dustrict except Mundgod	871128	720423	83%
2	Belgaum	Khanapur	174922	93964	54%
3	D.Kannada	Coondapur,Karkala,Udupi,Belthangady, Puttur, Sullia	707089	235871	33%
4	Shomoga	Sagar, Hosanagar,Thirthahalli	457791	123702	27%
5	Chickmagalur	Koppa, Mudigere,Shringeri	217913	43512	20%
6	Hassan	Sakaleshpur	105400	18210	17%
7	Kodagu	Entire District	410775	135654	33%
8	Mysore	H.D.Kote, Gundlupet	334745	76847	23%
		Total	3279763	1448183	44%

CHAPTER 4

NTFPs IN THE TROPICAL FORESTS OF WESTERN GHATS

There are numerous species of plants and plant products used as NTFP in Westrn Ghats. The list is exhaustive as the use varies from one region to another within this region. We have attempted to provide a list of NTFPs in Western Ghats, together with its availability (season) use, and importance. We have to admit that this list is not comprehensive enough to include all the NTFPs collected in Western Ghats. This is the list we came across during the study of 14 clusters in Western Ghats.

1. Murgalu:

Other names: Punarpuli, Bhirinda, Muruvanhuli and Kokum.

Botanical name: *Garcinia indica*

The tree grows to a height of about 15 to 20 meters. Generally found in moist deciduous, deciduous and in semi-ever-green type of forest. The plant starts to yield when it becomes three-year-old. Bili (White) Murgalu and Kempu (Red) Murugalu are the two varieties depending on the colour of the rind. The white one is believed to be of more medicinal value. The favourable condition for the tree is in open, and less density areas.

Season: Flowering starts from December and fruits in April and May.

Harvesting: One has to climb the tree to collect the fruit, collectors also use long sticks with a hook at the end to harvest the fruits. Women pick the fruit, which are fallen on the ground. If the tree is in the private land or near the house then only the ripened fruit are harvested, otherwise unripe fruits are harvested. A well-grown tree single tree yields 15 kilograms of dry rind.

Processing: After harvesting the rind and the seed of the fruits are separated and sun dried for a week. The processing work is done by women. If it is unripe, fruit then it is cut in to two or three pieces and the rind is dried along with seed. The seed is also sun dried for few days. Outer husk is removed and seed is crushed to extract oil.

Use: the rind is used as tamarind substitute and in preparing Kokum juice. It has good medicinal property. Oil is used in frying dishes, as medicine especially as demulcent and soother.

Marketing: Rind is marketed to local agent of the contractor or to the local buyer. Price was Rs 25 to 35/kg during 1997-98. There is no established market for Kokum oil. It is locally sold at a price of Rs 80 to 100 per kilogram.

The Kokum juice is available made from ripe fruits in hotels bearing different commercial names. The price of such Kokum Juice varies from Rs. 28 to 36 per litre. (1997-98).

Trend: The price of the dry rind is increasing over the years. It was Rs 2 to 3 per kg during 1990-91 and now it is Rs 25 to 30 per kg. There is change in harvesting technique. Earlier only the ripe fruits were harvested but now unripe fruits are also harvested, the branches of trees are also being cut to collect maximum quantity.

Importance: 1. Commercial and Consumption. (Equal importance)

2. Medicinal

2. Jeerksina mara:

Other names: Dyavanige hannu, Jolige hannu, Deerksinakayi, Jamige hannu.

Botanical name: *Garcinia pictorius*

The tree grows to a height of 18 to 20 meters. Tree is found in moist deciduous, semi-evergreen and in evergreen type of forest.

Season- the fruit become ripe during February-March. However, people collect the unripe fruit during December and January.

Harvesting- the unripe fruits are harvested by climbing the tree. The women usually pick the fallen fruits on the ground. Only the children collect the ripe fruits and eat.

Processing: The unripe fruits are sliced into pieces. It is then sun-dried for 4 to 5 days, by mixing it with salt. This is kept in a air tight container and preserved for more than one year.

Marketing: The product has not yet found market demand.

Use: the unripe fruits are used as tamarind substitute. However, this is not used in all parts of Western Ghats. The use is found mainly in Chikmagalur district and in few parts

of other district. The leaves are used to thatch the goragu traditional raincoat prepared by wate bidiru or reed). Fruit has a juicy pulp with a peasant acid flavor. The leaves are also used to cover the small cane baskets, which are used for storing salt. It is also used as a pest repellent to preserve wooden planks.

Importance: 1. Consumption

2. Medicinal

3. *Uppage*:

Other names: Mantapuli, Uppangi, Seeme hunase.

Botanical name: *Garcinia gummi-gatta,*

This is a found in the evergreen tropical forests of Western Ghat. Fruits are yellow or red in color when ripe, but are too sour to be eaten raw.

Season: The flowering starts in March and April and the fruits are harvested in June, July, and August. Basically men harvest the fruit from the trees in the forest and women occasionally go along with them to pick the fallen fruits on the ground. The fruits from the trees in the private land or near the farmhouse are also picked by women.

Processing: The processing is usually done by women, children, or elderly people in the family. Men do the processing work if the quantity of fruits harvested is large.

The seed and the rind are separated from the ripe fruits. The unripe fruits are sliced in to two or more pieces along with the seeds. A separate firewood chullah is prepared to dry the rind. It takes about 3 to 4 days to dry the rind under continues fire on chullah.

Seeds are mixed with firewood ash and dumped in the rainy season. After monsoon it is sun dried, outer husk is removed from the seed, crushed and oil is extracted.

Marketing: *Uppage* is one of the major commercial NTFP in Western Ghats. People are able to earn highest income from *Uppage* than any other NTFP's. Today (1999) the price of the dry rind is Rs 60-70/kg, which were just Rs 3 to 5 per kg during 1990-97. The collectors sell the product to the agents recruited either by legal agents who got tender to collect this or to the illegal traders.

The oil extracted from *Uppage* is used to fry the food dishes and as ghee. Price of *Uppage* oil is Rs 100 to 110 per kilogram.

Use: Rind is used as a sour in food, especially in making fish curry. The oil extracted from the seed is used as ghee, to fry the dishes. It is also used as medicine. The extract of this is used to control the obesity in developed countries.

Trend: Earlier (about 20 years back), only the seed from the *Uppage* was collected to extract oil. The rind was collected for commercial purpose. The price was Rs 2 to 4 per kg. The commercialization started in 1985 as the demand increased due to export demand. The harvesting technique has completely changed in recent years. In the beginning people were collecting the rind of *Uppage* only from the fallen fruits. Now they have started to pluck the fruits from the tree. At present, unripe fruits are collected from the tree. Cutting of branches or even the green tree is common.

Importance: 1.Commercial.
2.Consumptional
3.Medicinal

4. Rampatre

Other names: Malabar nutmeg, Kanagi, Bombay mace

Botanical Name: *Myristica malabarica*

Season: The fruits are harvested in January February.

It is a moderate sized tree found in the evergreen forests of Western Ghats in Karnataka and Kerala.

Harvesting: Earlier only the fallen fruits were collected, As the commercial demand has increased the people collect the fruit by climbing the tree. The trees are damaged during harvesting. Usually men do the collection.

Processing: Outer shell of the fruit is broken and a layer (inflorescence) in between outer and inner shell is collected for use. This inflorescence is sun dried for 3 to 4 days. The processing work is done by women.

Marketing: It is sold to local sub agents of the contractors or sometimes to illegal traders. The present price (in1999) is Rs 80 to 110 per kg.

Use: Used as a spice especially to adulterate with the mace of nutmeg.[*Myristica fragrans*] It is also used in preparing traditional Ayurvedic medicine.

Trend: There is increased demand and this has led to unsustainable harvesting through cutting the branch or the green tree to collect the nut.

Importance: 1Commercial.

2 Medicinal

5. Seege

Other Names: Shikakai, Kochi, Seege.

Botanical name: *Acacia concinna.*

It is a pricky climber. The pods are thick succulent, depressed between the seeds. The fruits may be shaken down or collected off the ground. It is found in deciduous and evergreen type of forest

Season: February, March and April.

Harvesting: The fruits are harvested from the climber by climbing the tree on which the climber has taken support. Harvesting is done by men only. Sometimes women also go to pick the fallen fruits.

Processing: The harvested fruit is sun dried for 3 to 4 days. It is then powdered and stored in container. It can be stored for more than 2 years. It is used for household consumption to clean vessels and wash hair. The dried fruit is marketed without powdering.

Marketing: Seege is marketed to local agent of the Contractor, or to the illegal traders, to LAMPS or other Co-operative bodies existing in certain areas.

Use: Used similarly as soap and along with soap nut powder.

Trend: In recent year's people in rural areas are using more soaps and detergents, in place of seege powder. Thus, the dependency on seege for household consumption is reduced. But it has become commercially important NTFP. The price was Rs 6 to 10 per kg in 1997-98. Harvesting technique has also changed. People started to pull down the climber to harvest the fruit. The awareness and fad of using natural product is increasing among urban people. Some small-scale industries have started to produce the Seege powder for the consumers.

Importance-1 Commercial

2 Consumptional

3 Medicinal

6. Vaate kayi

Other names: Vanti mara, Undekayi

Botanical name: *Artocarpus lakoocha*

Found in deciduous and in evergreen forests. Tree grows to a height of more than 20 meters. Leaves are oval, average length of the leaf is about 23 cms.

Season: Starts flowering in February and March. Fruits appear during May and June.

Harvesting: Only the unripe fruits are harvested from the tree by climbing the tree and plucking it using a stick with hook at the end. All the unripe fruits are harvested at once.

Processing: The unripe fruits are sliced into pieces and sun dried for 3 to 4 days. These pieces are mixed with salt and powdered. The dried pieces can be stored upto three years.

Marketing: The demand for Vaatehuli is increasing. In several region contractors and local buyers collect the produce. The price was Rs 50-60/kg of dried Vaate huli in 97-98.

Use: Vaatehuli is used a sour agent in making food items, as tamarind substitute. The bark of the tree is used in skin diseases.

Trend: After commercialization, the dependency on household consumption has decreased in recent years. The increased demand has led to unsustainable harvesting.

Importance: 1. Consumptional
2. Commercial
3. Medicinal

7. Antuvala:

Names: Soapnut, Norekayi, Kogatemara, Ritha,

Botanical name: *Sapindus emarginatus*

The species is found in the dry deciduous and in moist deciduous forests in south India. It is also cultivated near the houses. It is moderate sized tree with spreading crown.

Season- flowering from October to December. Bears fruit in January and February.

Harvesting- The fruits are made to fall down from the tree. It is Collected and transported to the house. Unripe fruits give better quality than ripe fruits.

Processing- The fruits are dried for 5 to 6 days. This can be stored for two to three years. Only the required quantity is powdered and used for household consumption.

Marketing: The dried fruits are marketed to the Contractors or local buyers. The price was Rs 6 to 12 per kilogram during 97-98.

Use- Antuvala is commonly used as soaps. The use of the pericarp of the soap nut is antiparasitic, has detergent effect on the skin. It is commonly used for cleaning textile materials and in the form of shampoo, in cleaning utensils, and the floor of the house. It also has medicinal value.

Trend: In recent years, the use of this product for household consumption is decreasing in villages. Soaps, detergents have replaced the use of Antuvala. No change in the availability of the product.

Importance- 1. Commercial

2. Consumptional

3. Medicinal

8. Arishina Andi:

Other names: Andi, Arishina gurugi, Kankutuka

Botanical name- *Garcinia morella*

It is a medium sized evergreen tree found in Western Ghats of Karnataka and Kerala. It is the indigenous source of Gamboge. Gamboge is a resinous substance obtained from the bark on wounding. Unripe fruit is green in colour as it ripens the colour changes to greyish green.

Harvesting- Fruits are harvested during April and May. Usually women collect the fruit. They pick the fallen fruits and bring it home. Only the required quantity is collected.

Processing- Fruits are broken, outer cover and the seeds are separated, the seeds are sun dried for 3 to 4 days. It is then roasted, powdered and finally boiled to obtain fat from the seed.

Marketing: Gamboge is collected by certain industries.

Use: The fat is brownish yellow in color with pleasant odor used in frying food dishes, to glow the light and as a substitute for ghee. In the past, the yellow colour pigment was used in preparing color in putting Rangoli(for decoration).

Trend: In recent years, the use of this product for household consumption is decreasing.

Importance-1. Consumptional

9. Analekaye:

Other names: Alale, Harda, Haritaki, and Yellow myrobalan

Botanical name: *Terminalia chebula*

It is found throughout the dry tropical forests in the country and in moist deciduous forests. Commercially known as Chebulic myrobalan.

Season: Fruits appear from November upto March.

Harvesting: Both Women and men go for harvesting Analekayi. Usually the fallen fruits are collected during December to February.

Processing: The fruits, which are freshly collected, are dried immediately, have yellowish color and fruits when allowed to lie on the ground have dark colour. For household consumption the fruits are dried and preserved. For medicinal purpose the dried fruit is powdered and preserved.

Marketing: The raw fruit is marketed locally. The price was Rs 50/gunny bag during 1997-98 (One gunny bag is approximately 45 kilograms).

Use: the mixture of Analekaye, Nelli and Tari is used in preparing traditional Ayurvedic medicine. The fruit is attributed with many other medicinal properties. It is used in making ink. It is used in leather/tanning industry. The fruits are used to increase the potency of alcoholic spirits. The powder of the fruit is mixed with cow dung while cleaning the floor of courtyard etc. This gives extra colouring to the floor. Ash of the fruit is used to treat foot and mouth disease in cattle.

Importance:1. Consumption.

2. Medicinal.

3. Commercial

10. Nelli

Other names: Embli myrobalan,Aamla, Amalaka

Botanical name: *Emblica officinalis*

It is a small to medium sized tree commonly found in the mixed forests in India. The species is propagated by seeds.

Season: November to February.

Harvesting: The fruits are collected by climbing the tree and also sometimes by picking off the ground.

Processing: the fruit is sun dried for 4 to 5 days, if it has to be preserved. Raw fruits are used as vegetables to make curries, pickles and make jam.

Marketing: There is market demand for Nelli. Traditional Medicine men, Ayurvedic pharmacies, industries are purchass Nelli through local agents. The price is Rs 6 to 8 for one kg of dry Nelli and Rs 3 to 4 per kg for raw fruit.

Use: the fruit is rich in vitamin c and iron, used as vegetable in making curries, pickles and jams. Triphala is one of the important drugs in Ayurvedic medicine prepared by Nelli, Anale and tari. It has various other medicinal properties and considered as one of the important ingredient in indigenous medicine.

Trend: There is no change in quantity available and the use of Nelli for household consumption is constant.

Importance: 1. Consumption
2. Medicinal
3. Commercial

11.Taari:

Other names: Shantimara, Gotinga

Botanical Name: *Terminalia bellerica*

It is large tree grows throughout the tropical forests in the country. It is one of the ingradient (triphalas) of indigenous medicine.

Season: Flowering occurs during April-May. Fruit appears during November to February.

Harvesting: only the fallen fruits are collected off the ground.

Processing: the fruits are dried and powdered to use for medicine purpose. Raw fruit as it is marketed.

Marketing: There is market demand for the product to be used in traditional Ayurvedic medicine.

Importance: 1. Medicinal,
2. Commercial

12. Dhoopa

Other names: Guggula, Bile Dhoopa, Ajakarna, white damar

Botanical name: *Vateria indica*

The tree grows mostly in moist evergreen forests but frequently extends to the semi evergreen and occasionally into deciduous forests.

Season: Normally the resin is harvested during dry seasons.

Harvesting method: The bark is wounded by knife in to V shape in the beginning of the dry season. The resin begins to ooze within 3 or 4 days and continuos flowing for two or three months. Sometimes fire is a ignited round the base of the tree to scorch the bark.

Processing : Raw resin is heated and filtered to separate the extra particles.

Trend: The government auctioned collection of Dhoopa to certain contractors. The contractors recruited agents to collect this from Dhoopa in the tropical forests. Unscientific method of harvesting has damaged the tree. Scratching the tree, making deep wound to younger plants, and putting fire to the stem has caused the death of these of plants/trees. Today the availability of this species is reduced and the government has banned the collecting of this product.

Marketing: Raw Dhoopa is sold for about Rs 30 to 40/kg and filtered one is sold for Rs 130 to 160 /kg.

Importance: 1. Commercial

2. Religious

13. Dalchini

Other name: Cinnamon, Tamulapatra

Botanical name: *Cinnamomum spp.*

Medium to large size tree grows in the evergreen forests. The bark and the leaves have pleasant fragrance.

Season: Flowering occurs during December upto February, fruits appear from July September.

There are three items commonly collected by the forest dwellers. They are Dalchinni leaves, buds, and bark.

Harvesting: The best time for harvesting the bark is in the rainy season. The outer bark is scrapped off. The branches are cut to collect the leaves. In the same way the tip of the branches are cut to collect the Dalchinni moggu (buds).

Processing: The bark is dried for about three days in the sun and then under shade. The leaves are also marketed. The buds are plucked by hand from the branches of the tree, sun dried for three to four days and then it is sold.

Marketing: The products are marketed to contractors or to co-operative socities like LAMPS, or to Ayurvedic pharmacies. Price in 1997-98 is Rs.25-30/kg of bark. Rs.6-7/kg of leaves, and Rs-60 to 80/kg of moggu (bud).

Use: The bark and leaves are used to extract oil. The chief oil extracted is eugnol. It has medicinal properties and used as spices. The moggu (buds) are used as spices.

Trend: Continuos collection of bark and leaf has reduced the number of Dalchini trees. Unscientific method of harvesting is the major cause for this. This has led to decrease in the availability of the product.

Importance: 1. Commercial

2. Medicinal

3. Consumption

14. Wild pepper

Other name: Kalamirch, Mire, Kaadu menasu

Botanical name: *Piper nigrum*

Pepper is a tropical large woody climbing plant. It requires heavy and well-distributed rainfall.

Season: Fruit ripens in the month of March, April, May.

Harvesting: The fruits are harvested from the climber. One has to climb the tree, on which the climber grows or has to use the ladder.

Processing: The fruits are sundried for about 4 days. Then the footstalk (gunju) of the fruit is separated. Sometimes the fruits are dipped into hot water for about five minutes.

Marketing: Wild pepper is marketed to Contractors or to Co-operative societies. The price was Rs 100 to 130/kg in 1997-98.

Uses: Fruit is used as spice and for medicine purpose. The leaves are used as fish poison and as medicine.

Trend: At present the availability of wild pepper is reduced. Unscientific method of harvesting and the tenurial insecurity is the major cause. When the price of the wild pepper increased, number of people collecting it has increased. They started to collect maximum quantity of wild pepper in minimum period, resulting in cutting and pulling down the climber or cutting the tree on which climber is growing.

Importance: 1. Commercial

2. Medicinal

3.Consumption

15. Betta (Canes)

Other names: Betta, Rattan, Bet, Vera and Canes

Botanical name: *Calamus spp.*

Canes are long slender stems of certain trailing or climbing palms, which are distributed in the tropical and sub-tropical regions. They are found in wet parts particularly along the edges of fresh water swamps or banks of rivers. Six species of canes are found in Western Ghats of Karnataka. They are-

1. Handi betta (*Calamus thwaitesii*)
2. Halu betta (*Calamus rotang*)
3. Sanna betta (*Calamus pseudo- tenuis)*
4. Nayi betta (*Calamus travancorica*)
5. Neeru hambu (*Calamus viminalis*)
6. Naga (*Calamus spp*)

Harvesting: Canes are ready for harvesting in about seven to eight years. They are mature when the leaf sheath starts browsing and the bottom potion is exposed. It is harvested during winter season when they can be dried quickly in the sun. After the cane is pulled down from the supporting tree, the leaves and leafs sheath are cut. Men do the harvesting.

Processing: For making baskets and other articles, the canes are sliced immediately within one or two days of harvesting and then dried in the sun. For making furniture,

walking sticks etc, the cane is dried in the sun without slicing. While preparing the articles it is immersed in water for few hours and then used.

Marketing: The government has auctioned the harvesting of cane to the Contractors or to Co-operative Societies like LAMPS. They purchase the cane from the collectors or recruit agents/labours to harvest the cane from the forest. Local people harvest the cane for their household consumption and some of them do sell the products to locally buyers. The price of the articles depends on its availability in the surrounding forest.

Use: Cane is used in various agriculture purposes, as fibers for fencing and house construction. Various type of baskets are prepared using cane, Cradles, furniture, umbrella, handles, walking sticks, cricket, hockey bat handles, several fancy articles and many more things are prepared.

Trend: Earlier, it was available in plenty in the forests. People were using it for various purposes and some persons were earning good income by manufacturing cane articles. But the availability has suddenly decreased when the government auctioned the harvesting of cane. Contractors collected all the cane available in the forest including immature and young canes, whereas people were collecting only the mature canes in a sustainable manner. Now the demand for cane is several times more than its availability. People are forced to harvest any kind of cane present in the forest like immature and younger canes.

Importance: 1. Consumption (handicrafts)

2. Commercial

16. Jenu

Other name: Madhu, Shahad Honey

Botanical name: Apis spp

Honey is natural thin fluid collected from bee colonies. The colour and flavour of honey depends on the nature of the nectar and the fragrance of flowers, which the bees visit. There are four varieties of honeybees.

1. Hejjenu, Rock bee (*Apis dorsata*)
2. Tuduvi, Indian bee (*Apis cerana*)
3. Kolujenu (*Apis florea*)
4. Misari or Nusri Dammer bees (*Trigona spp*)

Rock bees yield higher quantity of honey. They build their combs on the branches of big trees or on the buildings. Their stings are quite painful. They store the honey in the upper chamber of the comb, particularly in the bigger cells.

Indian bees (*Apis cerana*) are the second highest honey yeilders. They build their combs inside the hollows of tree or anthills. They are reared in boxes. There is another variety of Indian bee, which builds only one honeycomb. This is locally known as '*hotterumma*'. They build their combs in the hollows of tree but there should be enough light inside the hollow.

Apis florea are smaller bees, build their comb on small branches of the tree. Dammer bees are the smallest bees and lowest honey yielders. Build their combs on small hollows in the trees.

Harvesting: Honey hunter climbs the trees and lights fire near the comb to harvest rock bee honey. The fire should be in such a way that it produces maximum smoke, but no flame. Usually coir brooms are used to smoke the hives. Some of the other species locally known as *Udi soppu* is used by *Jenukuruba* tribes of H. D. Kote. Thus, the bees are driven away. Honey is collected in containers, which is sent down with the help of a rope. Too much of smoke or fire kills the bees. Harvesting is done usally in the night. Indian bees are harvested by making a small hole in the entrance of hollows.

Processing: Villagers do not process the honey. They just separate the honey from the wax by squeezing. Honey extractor is used to harvest the honey from Indian bee reared in boxes.

Honey is separated in centrifuge, or sometimes it is heated to remove moisture. Heat should be just sufficient to help in melting wax. Wax is taken out from the surface.

Use: Honey is commonly used as a natural sweetener. It has various medicinal properties. There are many Ayurvedic medicines that are taken along with honey. Wax is used for artificial hives as a polisher and for water proofing of leather goods etc.

Trend: *Apis cerana* is effected by *Thai-sac-brood* disease. Degradation of forest, destruction of hollows in the trees on which bees build their hive is the reasons for low yield of honey in recent years. Decrease in the foraging for bees are another cause for low yield of honey. Use of pesticides, especially on coffee plantations on other crops/trees

has negative impact on honeybees. Increase of monoculture plantations has affected the diversity of natural plant species and hence the diversity and availability of flowers throughout the year. Unscientific harvesting method of honeycomb, widening of the entrance of hollows so as it allow sunrays enter are the other reasons for decrease in the number of hives in recent years.

Now the quantity of honey available in the forest has decreased and villagers sell almost all the honey that they have collected as it fetches high price.

Marketing: Honey is sold to the sub agents of the Contractors, or to the Co-operative Societies, which collects NTFP or to local buyers. A large quantity of honey is also marketed through other channels like small trading centres along highways.

Importance: 1. Medicinal

2. Commercial

3. Consumption

17. Bamboo

Other names: Bidiru, Gala, Bans

Distributed in the tropical forests of the country. There are 136 species of Bamboo's in India.

Hebbidiru (*Bambusa arundinacea*) kirubidiru (*Dendrocalamus strictus*) garate or shame bidiru (*Oxytenanthera monostigma*) and Vaate (*Ochlandra rheedi*) are the varieties found in Karnataka.

In certain varieties of Bamboo, flowering occurs once in 40 to 60 years in other varities once in 30 to 40 years.

The mature clumps (pole) are harvested for use. The culmp (pole) are sliced into pieces to prepare articles.

Use : Bamboo is mainly used in manufacturing pulp and paper. As poles in construction of huts, houses. It is used preparing various agriculture equipment, for fencing work, for furniture, mats, baskets etc.

Vate (Reed) is used in preparing mats, baskets, and other handicrafts. It is also used for making flute.

Bamboo shoot: In the monsoon the tender Bamboo shoots are used as one of the important vegetable. Pickles are also made using bamboo shoots.

Importance: 1. Consumption

2. Commercial

18. Mango

Other names: Mavu, Aam, Amba, Amra

Botanical name : *Mangifera indica*

It is a large semi evergreen tree found in the tropical forests along the streams and other water bodies. It is cultivated in all parts of the country.

Season: Flower appears during January and February and fruit appears from March to August.

Harvesting: Unripe fruits are collected to be used as vegetables. The ripe fruits are picked to eat or to be used in dishes. Sometimes unripe fruits are collected and allowed to ripe in the house.

Processing: Unripe fruits are collected before the kernels appear inside the fruit to prepare pickles. They are locally called *Appemidi*. These unripe fruits are immersed in salt and preserved for more than one year. The unripe fruits, just before they ripe are collected and preserved to be used as vegetables. Fruits are allowed to ripe under paddy straw. Raw and unripe fruits are used as vegetables.

Marketing: There is market demand for those mangoes available naturally in the forest that can be pickled *(Appemidi)*. The price in 1998-99 varies from Rs 15-20for100 mangoes to Rs 80 to 90 per 100 mangoes.

Trend: Due to increased demand and high price for *Appemidi* people especially small agents and from neighbouring towns of that forest region have started to cut the branches of trees to harvest the mangoes. It has destroyed the resource.

Importance: 1. Consumption

2. Commercial.

19. Ennemara

Other names: Chowpaini, Paini

Botanical name: *Hardwickia pinnata*

It is a big evergreen tree. Grows to a high of more than 30 meters. In Karnataka the trees are found in Coorg and Dakshina Kannada district. Season-Flowering appears during February.

Harvesting : A hole is made to the tree to get resin from the tree. Harvesting is done in drier seasons. About 15 to 20 liters of oil is obtained from one tree.

Use: The resin obtained from the tree is used as varnish.

Marketing: It is sold to local buyers and sometimes to outsiders. The price is Rs 125-130 per liter in 1997-98.

Trend: Many trees have died after over extraction. The government has banned the extraction of resin from the tree. Inspite of the ban resin extraction is being done illegally.

Importance: 1. Commercial

2. Consumption

20. Mushrooms

Other names: Anabe, Alabu

Mushroom is a fungus comprising two parts. The portion above the ground consists of a cap and a stock and is edible. Underside of the cap, there are numerous radiating gills. The underground part is like roots. There are more than 20 edible mushrooms found in the tropical forests of Western Ghats in Karnataka. The name differs from place to place. A large number of mushrooms appear during monsoon. They appear particularly in places, which are rich in humus. There are other poisonous mushrooms.

1.Mara anabe (*Pleurotus osteratus*) A single mushroom makes it appearance on the tree during monsoon. Size is quite big. Available in lesser quantity.

2. Bhogi anabe or Haigana anabe (Pav anabe, Hagad anabe): Found on the ground under Bhogi (Haiga) trees (*Hopea wightiana*). This variety of anabe is found in aboundance sometimes 2 to 3 cane baskets (15 to 20 kgs) in one place.

3. Halla anabu- A row of mushrooms is found in the forest during monsoon, sometimes upto a kilometer.

4. Hullu anabu- (*Entoloma macrocarpum*) grows on the side of the paddy field and on white ant hills. It is delicious.

5.Heggalu Anabe or Sidilu Anabe- It is a large kind of edible mushroom. People believe that this mushroom grows when it is lightning and thunder.

Kallu anabe- It looks like a small ball. Rarely found in the forest.

6.Koole anabe- Looks like a cricket ball. Outer cover of the cap like portion is very thick in size, and this outer cover has to be removed while cooking.

7.Gobbara Anabu- Grows on the heap of manure or on rotten leaves. It has bad smell and some people do not eat this variety.

Processing: Some varieties of mushrooms have to be boiled before cooking. Outer cover of the mushrooms has to be removed for some varieties before it is edible.

Marketing: People collect the mushrooms and sell it in the nearby towns during market days. The price varies from Rs 25/kg to Rs 50 per kilogram.

Use: Mushroom is commonly used as vegetable. It is a source of nutrition.

Trend: The forest dependent communities have observed that certain variety of mushrooms like Haiga anabe grows only under some specific plants and specific conditions. The, degradation of forest may indirectly affect the availability of mushrooms.

Importance: 1. Consumption

2. Commercial

21. Halasu

Other name: Panasa, Kathal and Jack tree

Botanical name: *Artocarpus heterophyllus*

It is an evergreen tree found in Western Ghats, but it is also grown elsewhere.

Season- Flowers appear between December and March. The tree starts yielding fruits from March September or October. There are two varieties of fruits found in the region depending on the mesocarp of fruit.

The inner portion of the fruit along with the seed is immersed in salt and preserved for 5 to 6 months. This is used as vegetable. The seeds of the ripe fruit are allowed to dry and

afterwards a layer of red soil (Kemmannu) is coated on it. The seeds are stored for more than one year through this method.

Uses: The fruits are edible, used in making several sweet dishes, papads and dosa. Unripe fruits and seeds are used as vegetables. Seed is roasted and eaten. Several dishes are also prepared from seeds. Papads are made out of inner portion of unripe fruits. Bark and the leaves are used in several religious functions.

Importance: 1.Consumption

2.Commercial

22. Baine

Other names: Bagani, Paine, Berli, Sago, Toddy palm.

Botanical name: *Caryota urens*

It is a tall palm found in Western Ghats and in Eastern Ghats of the country.

Use: All portions of the tree are used for various purposes. Leaf sheaths petioles and flowering stalks yield fiber. The petioles are immersed in water for few days and then fiber is prepared. The leaves are used to thatch the huts and small sheds in the paddy field from where the farmers keep watch of the wild animals. The fiber is used for fencing work to be tie the poles for making ropes, soft brushes and it is also used for making brooms. The palm yields a plentiful supply of sweet toddy from the time it begins to flower. The juice is extracted from the spadices before they are fully developed. The stem is used for planks for fencing work, and various other agricultural work.

Baine powder, obtained from the kernel of the stem is used as a food.

Trend: These trees are decreasing due to overharvesting. Several green trees were cut down to obtain powder from the Kernel of the stem. The government auctioned the Baine trees to extract Toddy (wine). Unscientific method of harvesting the wine has resulted in death of trees. Continuos use of these trees for various agriculture purposes has led to decrease its availability.

Importance: 1. Consumption (agriculture, toddy)

2. Commercial

23. Ichalu

Other name: Khajur, Shindi, and Wild date.

Botanical name: *Phoenix sylvestris*

It is a short palm found in the plain areas of tropical forests. Trunk is covered with persistent bases of petioles and pinnac leends with short points.

Season: The leaves are harvested during dry season. Sap is obtained during winter. Fruits appear during June and July.

Harvesting: For tapping the sap, the lower leaves along one side of the trunk are cut off and the bark is removed to expose the inner soft layer. The sap (Nira) coming out through the trunk is allowed lip in the earthen plot. Mature leaves are cut off during dry season. The leaves are dried in the sun for about a week. Then the footstalk of the leaf is removed. Leaves are separately stalked according to the length. The leaves are then sliced into pieces to weave the mat.

Marketing: Weaving of mats and brooms is done by the women of weaker community. They sell these products to other landowners and get old sarees and cloths. Some times, they sell it to local merchants and in *Jatras* (Local Fairs). Price is Rs 30 to 40 for a mat (of size 4x6ft).

Use: Sap (*Nira)* is obtained from the stem. Villagers especially children eat the kernel of the stem and fruits. The leaves are woven into mats, brooms, etc.

Trend: Availability has decreased. Continuous use for leaf and sap, forest fire, cutting off the plant to eat the kernel, tapping the sap, degradation of forest due to logging, illegal felling and encroachment are the other reasons. In recent years people are coming from plain areas to Western Ghat region to harvest the Ichalu leaves. Group of 10-15 people camp in the forest for 8 to 10 days and harvest truckload of Ichalu leaves. They cut all leaves present in the plant, even from smaller and younger plants leading to destruction of the tree.

Importance: 1 Consumptional

2.Commercial

24.Tumri Leaves

Other name : Tupra, Beediele, Tubare, Tendu.

Botanical name: *Diospyros tupru (Diospyros mclanoxylon roxb)*

Beedi leaf occurs in the dry mixed deciduous forests of India. It is the single biggest item of minor forest produce in certain states of India. In Karnataka, the quality of beedi leaves is poor.

Harvesting: Normally, the collection of Tumri leaves is done during dry season. Women and Children generally belonging to weaker sections of the go for collection of the leaves. Leaves are collected in the early hours of the day. Leaves are plucked by hand along with small twigs.

Importance:1. Commercial.

2. Consumptional.

25. Surgi flowers

Other name: Vundi, Gargundi, Punnaga

Botanical name: *Ochrocarpus longifolius*

It is a big tree found in the Western Ghats. The tree grows to a height of more than 25-30 meters.

Season: Flowers appearance during February and March. About 4 to 5 kilograms of flowers can be obtained from a tree.

Harvesting method: Generally people climb the tree to harvest the flowers. They pluck the flowers that are accessible.

Processing: Surgi flowers are dried in the sun for 4 to 5 days. Garlands are prepared and this could be kept for a month. Garlands are also prepared from the fresh flowers.

Marketing: the dried flowered is sold to the agents of the Contractor or to the Co-operative Societies. The price is Rs 50 to 60/kg of dry flower (in1997-98) Collectors also sell the garlands, especially along the highways.

Use: Flowers are used for decorative purpose and in perfumery work. It has medicinal properties.

Importance:1. Commercial

2. Consumptional

3. Medicinal

26. Kaadu Arishina

Other name: Ambehaladi, Zedoari, Jangli haldi

Botanical name: *Curcuma zedoaria*

It is a small herbaceous plant like turmeric. Plant grows to a height of about one to two meters.

Season: Tuber of the plant is harvested during January and February (in *Makara* month).

Harvesting : The tuber of the plant is sliced and crushed to make paste. The paste is powdered, stored in a container with water. Froth like thing comes out from the paste and floats on the surface of water which is removed. The process is repeated for two to three days changing the water in the container. The Paste is then sun dried for at least two days. This can be stored for more than two years. Kaadu Arishina product is used as healthy drink. It cools the body, and cures stomachache.

Importance: 1.Consumptional

2. Medicinal

27. Maada haaglu

Other name: Kaarchi balli, small bitter gourd, Zanglikarel, Kartali, Adavihagalu.

Botanical name: *Momordica diosica (Roxb)*

It is a climber or spreading shrub found in the tropical forests. Tender fruit is used as vegetable.

Season: Fruit appears during August, September, and October.

Price per Kilogram is Rs 75 to 125 (in 1998-1999) . It also has medicinal property.

Trend: Earlier it was abundant. However in recent year the availability is decreasing. In addition, in some region the species has become rare. Deforestation, encroachment of forests fire, monoculture plantations is the major cause for reduction in availability. Besides, cattle and wild animals, graze this climber.

In recent years domestication of this climber is being done in several places (Chikmagalore District) Maadahaglu is grow in 10 acres of land.

Importance : 1. Consumption

2. Commercial

28.Gavantle Kayi

Other name: Gavaldekayi

Botanical name: (Not known)

It is a climber found in the tropical forests.

Season: Tender fruit appears from July to September. Unripe fruit is used as vegetable. The leaves and roots have medicinal properties.

Trend: availability of Gavantle kayi. Pulling down the climber to collect the fruit, degradation of forest due to several reasons is responsible for the decrease in the availability.

Importance: 1. Consumptional

2. Medicinal

29. Kasarka

Other name: Katarike, Vishamushti, Nanjina koradu, Itti, Kazro.

Botanical name: *Strychnos nux-vomica*

It is a medium to big size tree found in evergreen to deciduous type of forest. It attains a height of 10 to 12 meters.

Season: Flowering occurs in March and April. Fruit appear in June.

The plant is widely distributed throughout the tropical regions of India.

Contract system is followed to collect the seeds. The fruits are collected from the trees as they are ripe or immediately after they fall on the ground. The pulp is removed by rubbing on a sieve. The seeds are dried in the sun for about a week.

Use: The drug *Nux-Vomica* is widely used in general prescriptions. Strychnine and Cruine are extracted from the seed. These are used in the treatment of nervous disorder and paralysis. The seeds are used as fish poison. The bark is used as a tonic and as an external application for skin diseases. Decoction is prepared from the leaves of Kasarka to be used as bio-pesticide and as pest repellant. The green leaves are mulched on coconut and other plants to avoid attack of the pests.

Trend: Availability of the plant is decreasing in recent years. After commercialisation, the seeds are collected in large quantity. Thus, the regeneration rate is decreasing in

several regions especially in coastal regions besides the green leaf is harvested by cutting the branches of the tree to be used as pesticide. All these have resulted in decreasing in the number of trees.

30. Mukkadaka

Other names: Rammana soppu, Nukkataka

Botanical Name: *Lasiosiphon erio cephalus*

It is a shrub found in the Western Ghats.

Use: The leaves are used as bio pesticide and as fish poison. Preparation of the decoction- One kilogram of leaves is mixed and poured into a container with boiling water (of about 5 liters). The solution is ready for spray. The solution is diluted to about 1:10 with water while spraying. This decoction is widely used in treating leaf roller disease in paddy.

Trend: In recent years, number of farmers using this bio-pesticide is decreasing. Easy availability of chemical pesticides has replaced this.

Importance: 1.Consumption (Bio-pesticide)

31. Lakki

Other names: Nakki, Nukke, Nekki, Chaste tree, Nirgandi

Botanical name: *Vitex negundo*

It is small tree (shrub) with quadrangular whitish branchlets found in wastelands and grown for reclamation of waste land. Leaves possess insecticide properties.

Use: Leaves are used as mosquito repellant as pest repellant in preserving food grains. Leaves, bark, and fruit have medicinal property. Leaves are used to treat swellings, sprains, toothache headache etc. Bark and fruits are used treating fever, cough, cold etc. Besides, certain communities worship the plant.

Importance: 1. Consumption (Pesticide, Religious)

2.Medicinal

32. Kaare

Botanical name: *Canthium parviflorum.*

It is a small thorny bush found in the Western Ghats.

Use: Unripe fruit is used as fish poison. Leaves have medicinal property. The shrub is grown as live fence.

Importance: 1. Consumption

2. Medicinal

33. Nerlu

Other name: Jambu, Jaman

Botanical name: *Syzigium cumini*

It is a large evergreen tree found throughout tropical and sub tropical parts in the country.

Season: Flowering occurs from March to May. Fruit appears during June July.

Use: Fruits are edible. The juice of the unripe fruits is used for preparing vinegar. Bark, seeds, leaves, fruit are used as medicine. Bark yields a red dye used for colouring agent.

Importance: 1. Consumption

2. Medicinal

3. Commercial

34. Nurkalu

Other names: Charoli, Chironji, Cuddapah almnond

Botanical name: *Buchanania lanzan*

It is a medium sized tree found in the tropical and sub tropical regions of the country.

Season: The fruits appear during April and May.

Use: Pulp of the fruit is edible. The seed inside the hard outer cover is also edible. The bark yields gum. The branches are commonly used in making handle of saber. Bark has medicinal property.

Importance: 1. Consumption

2. Medicinal

35. Naaga Sampige

Other name: Naga kesari, Naga champa, Ironwood.

Botanical name: *Mesua ferrea*

It is a medium to large sized tree found in evergreen and semi-evergreen forests of Western Ghats.

Season: Whitish flowers appear during February to April. Fruit ripens during May.

Use: Earlier, people used to prepare candles from the seed, which is not in practice in recent years. Flower buds, flowers are used in cosmetics.

Importance: 1. Consumption

2. Medicinal

36. Sampige

Other names: Kolasampige, Champaca,

Botanical name: *Michelia champaca*

It is a medium to large sized tree found in tropical forests. It is also grown in gardens.

Season: Flowering appears in dry season in the month of April and May.

Use: The oil obtained from flowers is used in perfumery work.

Importance; 1.Consumption (Religious)

2.Medicinal

37. Nelanelli

Other name: Kerunelli, Bhoodatri

Botanical name: *Phyllanthus asperulatus*

It is a small plant found in Western Ghats.

Season: Flowers are usually found throughout the year.

Use: Leaves have medicinal property used in treating Jaundice and other liver problems. The decoction prepared from the leaves is used to treat headache.

Importance: Medicinal

38. Shatavari

Othername: Shatamuli, Halavumakkala Tayi

Botanical name: *Asparagus racemosus*

It is a scandent climber found is tropical forest.

Season: The rhizome of the plant is harvested during dry season.

Use: The roots are used as vegetables in the preparation of curry. The roots (tubers are fed to cattle to increase the milk production

Importance: Medicinal.

39. Ashoka

Other names: Khari, Asok, and Kenkali

Botanical name: *Saraca indica*

It is a small evergreen tree found in the tropical forests. It is also grown in gardens for its red-orange coloured flowers.

Season: Flowers appear from February upto May. Different parts of the tree have medicinal property. It is used in treating several diseases related to women. The tree is sacred for Hindus. Large number of trees is found around the Devara Kaadu (Sacred Groves).

Importance: 1. Consumption (medicine, religious)

40.Ankole

Other name: Akola, Dhera and Anasorali

Botanical name: *Alangium Salvifolium*

It is a small tree found throughout the tropical forests in India.

Season: the fruit appears in the month of July to August.

Use: Pulp of the fruit is edible. Different parts of the tree are used as medicine. It is one of the religious trees for Hindus.

Importance: 1. Medicine

41. Atti

Other name: Umbar, Udumbara

Botanical name: *Ficus glomerata*

It is a medium to large sized found in deciduous forests.

Season: Fruit, leaves, bark, and roots are used for medicinal purpose. The leaves are used as cattle feed. Leaves are also used in religious functions.

Use: Fruit appears during April-May.

Importance: 1.Consumption (Cattle Feed, Religious)

2.Medicinal

42. Amruthballi

Other name: Ugani balli, Gulvel, Madhuparni, Amrita.

Botanical name: *Tinospora cordifolia*

It is a climbing shrub found in the dry tropical forests.

Season: Whole year.

Use: In indigenous medicine, it is used as tonic for diarrhea and in chronic dysentery. It is used to treat the lever with honey. The paste is prepared from this climber with honey and applied to heal wounds.

Importance: 1. Medicine

43. Ala

Other names: Golimara, Vatavruksha.

Botanical name: *Ficus bengalensis*

It is a big tree found in evergreen forests in India. The sap and leaves are used as medicine especially with urinary disease. It is one of the religious trees for certain communities.

Importance: 1. Consumption (religious)

2. Medicinal

44. Ekke

Other names: Arka, Mandara

Botanical name: *Calotropis gigantea*

It is a perennial ground shrub found in dry deciduous forests in India. Roots, leaves, and milk sap have medicinal property. It is mainly used to treat abscess, scabies, toothache, worm in the intestine etc. It is one of the important religious plants.

Importance: 1. Consumption (religious)

2. Medicinal

45. Ondelaga

Other names: Brahmi, Urige, Ilikivi balli, and Manduka parni

Botanical name: *Centella asiatica (Hydrocotyle asiatica)*

It is a creeping aromatic herb found in wild throughout India particularly in moist regions. It is commonly found in spice gardens. The plant is used as medicine. It is taken as general tonic, and to treat cough. The oil extracted from the plant (Brahmi oil) promotes the growth of hair.

Importance: 1. Medicinal

2. Consumption

46. Kakke

Other names: Konde, Suvarnaka, Bhava. Swarna Phuspa

Botanical name:*Cassia fistula*,

It is a plant found in the tropical forests. Bark is the source of tannin.

Season: Flowering occurs in April and May. Ripe fruits appear from April.

Use: The root is used to cure fever, Jaundice, and Stomachaches. Pulp of the fruit, roots seed and leaves are used as purgative.

Importance: Medicinal

47.Karibevu

Other names: Curry leaf tree, Barsanga, Krishna patra, Karhinimb

Botanical name: *Murraya koenigii*

It is a small tree found in wild and is also cultivated.

Season: Throughout the year.

Use: Leaves, bark, root and seeds have medicinal property. The leaves are used for flavouring dishes.

Importance: 1. Consumption

48. Kachu

Other names: Kaggali, Khadira tare, Khaira

Botanical name: *Acacia catechu*

It is a medium sized tree mostly found in deciduous forest. There are three subspecies in Kachu-1. Catahu, 2. Catechuoides, and 3. Sandra.

Season: Unripe fruit appears in September - October. Use-Katha and Cutch is obtained from the wood. Katha is mainly used in betel leaf in making dyes. The tree is also used in preparing Ayurvedic medicine. Agriculture equipment is prepared from the tree. The tree is also used in religious functions/festivals.

Trend: certain small industries were established to extract Katha and Kutch from the tree. Over extraction of these products has destroyed the availability of species in certain regions.

Importance: 1. Commercial,

2. Religious

3. Medicinal.

49. Kedige

Other names: Mundige, Ketaki, and Screw pine

Botanical name: *Pandanus tectorius*

It is a shrub found in evergreen and moist deciduos forests, generally along the sides of water bodies. Suvarna kedige (*Pandanus furcatus*) and Mundaga (*Pandanus canaranus*) are the two sub species found in Western Ghats of Karnataka.

Use: The oil obtained from the inflorescence is used in perfumery work. Root has medicinal property. Fiber is obtained from the leaves, which is used for making mats, sacks, nets etc.

Importance: 1.Consumption

2.Medicinal

50. Garike

Other names: Ambate hullu, Doorva

Botanical name: *Cynodon dactylon*

It is a perennial grass found throughout the country.

Season: Normally found throughout the year.

Use: Grass is used in purifying blood. It is also used as medicine to treat influenza. It is used in urinary disorders. Besides, it is used as vegetable in making curry and Tambli (dish). It is also used in religious activities.

Importance: 1. Consumption (religious)

2. Medicinal

51.Kuntanerlu

Other names: Gudda nerale

Botanical name: *Elaeocarpus lancifolius*

It is a medium sized tree found in tropical forests of the country. Tender leaves and barks have medicinal property.

Use: Used in treating blood dysentery. Tender leaves are also used in preparing Tambli (dish).

Importance: 1. Consumption

2. Medicinal

52.Gudde Geru

Other names: Marking nut tree, Agni mukhi, Karekeru, Bhilava

Botanical name: *Semicarpus anacardium*

It is a moderate sized tree found throughout tropical forests in India.

Season: Flowers appear during June to September. Fruit ripens during December upto March.

Use: The black resin obtained from the pericarp of the fruit is used as varnish. Kernel of the seed is eaten. Oil extracted from the kernel is used to treat rheumatism. Seed is powdered, mixed with salt and used as tooth powder.

Importance: 1. Consumption

2. Medicinal

53. Chitramoola

Other names: Dipika, Vahni, and Chitrak

Botanical name: *Plumbago rosea* (Kempu chitramoola), *Pumbago Zeylanica (*Bilichitra moola)

It is a small perennial shrub found in dry deciduous forests. There two sub species 1.Red chitrmoola and 2. White Chitramoola. Root and bark have medicinal property.

Use: It is used to cure rheumatism, swellings, fever etc.

Importance: 1. Medicinal

54. Shivanne

Other names: Ganari, Gopabhadra

Botanical name: *Gmelina arborea*

It is a medium to large sized tree found in evergreen forests of Western Ghats.

Season: Flowering starts from February to April. Fruits appear during May-June-July.

Use: Yoke is prepared from this tree. The leaves are fed to the cattle. Leaves along with curd are fed to cattle to cure fracture in bone. Decoction is prepared with leaves and other ingredients to be taken as general tonic.

Importance: 1.Consumption

2. Medicinal

55. Aramadlu

Other names: Petlakayi

Botanical name: *Zanthoxylum ovalifolium*

It is a small tree found in tropical forests in India.

Season: Fruit appears in May and June.

Use: Unripe fruits are used in making pickles.

Importance: 1. Consumption

56. Aadusoge

Other names: Vasaka, Adulsa, and Addarasa

Botanical name: Adathoda *vasika (Now Adathoda Zeylanica)*

Use: Leaves roots, Flowers have medicinal property.

Season: Throughout the year.

Use: Used to treat cough, fever, asthma and in other respiratory disorders. It is also used in several veterinary diseases

Importance: 1. Medicinal

57. Bikke

Other name: Kambimena, Dikamali

Botanical name: *Gardenia gummifera*

It is a small tree found in deciduous forests in India.

Season: Fruit appears in July.

Use: Fruit is edible. Plant is also used as medicine.

Importance: 1.Consumption (Fruit)

2. Medicinal

58. Bilimullannu

Other names: Euran, Kottehannu

Botanical name: *Zyzypus rugosa*

It is a spiny shrub usually found in deciduous forests.

Season: Fruits during April to June.

Use: Fruit are edible.

Importance: Wild fruit.

59. Paragi

Other name: Karimullannu, Bahukantaka.

Botanical name: *Zyzypus oenoplia*

It is a straggling shrub found in tropical forests.

Season: Flowering appears in April and May. Fruits during June and July.

Use: The fruits are edible.

Importance: Wild Fruit.

60.Challe

Other names: Shelvant, Bahuvaraka

Botanical name: *Cordia myxa*

It is a small tree found in deciduous forests.

Season: Flowers appear in March to May. Fruit ripens during June to August.

Use: Fruit is edible and it has medicinal property.

Importance: Wild Fruit.

61. Kauli

Other names: Karandi, Kabli, and Karavanda

Botanical name: *Carissa carandas*

It is a small thorny shrub fund in deciduous forests.

Season: The fruit appears in April, May and in June. Unripe fruits are green in colour, which became almost greyish black when it ripens.

Use: Fruit is edible, unripe fruits is pickled.

Importance: Consumption (Wild Fruit and it is pickled).

62. Ranjalu

Other names: Bakula, Pagade

Botanical name: *Mimusops elengi*

It is a medium to large sized tree found in semi evergreen forests of Western Ghats.

Season: Flowers appears in February. Fruit appear during April to June. Fruits are edible.

Use: Scent is prepared from the flowers. Bark is used as medicine.

Importance: 1. Medicinal

2. Consumptional (Wild Fruit).

63. Hebbalasu

Other names: Kaduhalasu, Jungle Jack tree, Patavanasu, Hesva

Botanical name: *Artocarpus hirsuta*

It is a large tree found in evergreen forests of Western Ghats. Tree grows to a height of more than 40 meters.

Season: Flower appears during December. Fruit ripens in May and June.

Use: Fruit is edible. Bark and leaves have medicinal property.

Importance: 1. Medicinal

2. Wild Fruit.

64. Jummimara

Other name: Badrang

Botanical name: *Fagaria budrunga*

It is a medium sized tree found in wet evergreen forests of Western Ghats. The stem is generally surrounded by spines.

Season: Fruit appears during April and May.

Use: Fruits are used as spices and are pickled. The spines, which drop off, the bark, and which can easily detached are made into necklace and buttons.

Importance: Wild Fruit and it is pickled.

65. Madarangi

Other names: Garante, Mendika, Mailancha, Henna, Mehandi

Botanical name: *Lawsonia inermis*

It is a small tree grows in wastelands.

Season: Throughout the year.

Use: Leaves are the source of red dye, which is used for dying nails. Powder of dried leaves along with some other material is applied to hair for dying. Leaves and bark have medicinal properties. Mehandi is being marketed by certain small-scale industries.

Importance: 1.Consumptional

2. Medicinal

66. Nachike gida

Other names: Lajjawanti, Lajja machike, Lajalu, Muttidare muni.

Botanical name: *Mimosa pudica*

It is a common weed. Leaves are sensitive.

Season: Throughout the year.

Use: The plant is useful in the treatment of piles and in kidney store. It is also used in several other diseases.

Importance: 1.Medicinal

67. Ganapekayi

Other names: Kanape, Halle kayi, Pallekayi, Doddakampi, Garams

Botanical name: *Entada phaseoloides*

It is a large sized climbing shrub found in evergreen forests of Western Ghats mostly on the banks of water bodies. The seeds are flat and large, brown in colour.

Season: The fruits are found in the dry season.

Use: Some communities eat kernel of the seed. The seed is used for polishing chullahs and mud walls and floors. The seed is also used for decorative purpose. Certain communities use the bark of the shrub as soap.

Importance: 1.Consumptional

2. Medicinal

68. Ashwatha

Other names: Peepul tree, Arali, Pimpala

Botanical name: *Ficus religiosa*

It is a large deciduous tree found wild or cultivated throughout India. The tree grows to height of more than 25 meters.

Season: Throughout the year.

Use: Leaves are rich in nutrients. Bark, leaves, and the root have medicinal property. It is used in treatment of Asthma. Tree is one of the sacred trees for Hindus.

Importance: 1.Religious

2. Medicinal

69. Kathale

Other name: Kantala, Country plant, Sisal

Botanical name: *Agave* spp

Agave is a large genus of short stemmed plants bearing a rosette of long recet, pointed fleshy leaves. *Agave sisalana. Agave cantala, Agave cantala, Agave wightii, Agave americana, Agave verairuz* are the species found in India. The leaves are about 0.75 to 2 meters in length. The shoot apex grows to 6 meters to 8 meters height. Harvesting of leaves normally commences from 3rd to 10th year. The leaves are then immersed in water to extract fibre. It is cleaned in water and threshed on stone. Afterwards it is spread to dry.

Use: The fibre is used in making ropes, twines, cordage etc.

Importance: 1. Consumption

70. Dadasalu

Other names: Tadasalu, Kendalasu, and Daman

Botanical name: *Grewia tiliaefolia*

It is a small to medium sized tree found in deciduous forest in Karnataka.

Season: Flowers appears during February to April. Fruit ripens during May and June. Fibre is obtained from the bark.

Importance: 1. Consumptional

71. Kavalu

Other names: Goujal, Guddada ippe, Gaval

Botanical name: *Careya arborea*

It is a medium to large sized tree found in deciduous forest in India.

Season: White flowers are found in March and April. Fruits appear in June and July.

Use: Bark yields fibre, which can be used for making rope etc. Green leaf is collected from this tree to make manure. Bark has medicinal property.

Importance: 1.Consumptional

2. Medicinal

72. Kouri

Other names: Edamuri, East Indian Screw tree, Kavergi, Mriga shinga, Varkati

Botanical name: *Helicteris isora*

It is a small shrub found in dry regions.

Season: Flowers in July and August.

Inner bark of the plant yields a fiber. The twigs and branches are cut off and it is beaten on stone. Thus, the bark is removed form the twigs and branches, immersed in water for two days. It is then washed in water and dried in sun to obtain the fiber.

Use: Fiber is used in making rope.

Importance: 1. Consumptional

73. Basari

Other names: Dhedumbara, Juvvimara

Botanical name- *Ficus infectoria*

It is a medium sized tree found in deciduous forests. There are two sub species in Basari. One is Bilibasari and another is Karibasari. Karibasari is found in evergreen to semi evergreen forests.

Use: Inner bark of the branches and twigs are used in making fibre. Root has medicinal property.

Importance: 1. Consumptional

2. Medicinal

74. Ajjanapatte

Other names: Aranje, Bairi, Jaguri, and Jasunel

Botanical name: *Antiaris toxicaria*

It is a large sized tree found in evergreen forests of Western Ghats. Certain trees grow to a height of more than 70 meters.

Use: The inner bark yields a fiber, which is obtained by setting in water and beating it. The fiber is used for making sacks, cordage, ropes etc.

Importance: Consumption.

75. Muttuga

Other names: Muttulu, Palasha, Tripatrika, and Pasha

Botanical name: *Butea monosperma*

It is a medium sized tree found in deciduous forests of Western Ghats.

Season: Red flower appears during March-April while there are no leaves in the trees. Because of red colour of the flowers, the tree is also called as 'flame of the forest'. Fruit appear during May-June.

Use: The bark yields a red dye, commercially known as Bengal Kino. The leaves are used to make leafplates. Leaves are also used to wrap beedi leaves. Bark, root and seed have medicinal property. It is used to treat urinary diseases. The seed is used as anthelmintic. It is sacred tree.

Importance: 1. Consumptional

3. Medicinal

CHAPTER 5

STUDY OF FOREST COMMUNITIES USING NTFP.

The study of NTFP was conducted in 14 clusters of the tropical forests of Western Ghats, and has attempted to provide critical information on each cluster.

1. *ACHAVE CLUSTER:*

1. *Description of Village and Region*: Achave, a remote area situated at the foothills of the Western Ghats, is about 50 kilometres from Ankola on the coast and about 45 kilometres from Sirsi. The area is surrounded by hills of wet evergreen forest. Towards the west, there are some areas under teak plantation.

The communities residing in this area are *Kharevokkaligas, Goudas, Acharis, Haslars* (Scheduled Caste), *Naiks*, and *Havyaks*. The major crops grown in this area are paddy, arecanut, coconut, and spices.

Two villages, Kuntagani and Manigadde were selected for the study. Kuntagani is about 35 kilometres from Ankola, of the taluka head quarters. It is situated on the foothills of the crestline of the Western Ghats. The village is surrounded by thick evergreen tropical forests on the east with a height of about 600 meters.

The second study village in the Achave cluster is Manigadde. This is situated in midst of the Western Ghats. The village is surrounded by hills on three sides with a height of about 600 meters from mean sea level. Kuntagani has a higher population compared to Manigadde. The area is covered by evergreen and semi evergreen type of forests.

Table No: 5.1a

Land use in Achave cluster.

Area in acres	Manigadde	Kuntagani
Geographical area	3388.36	5823.25
Forest area	3337.00	5261.19
Areca	3.00	46.20
Paddy	32.00	357.00

Description of communities:

Nadavar Naiks migrated from the coastal town of Ankola to this village. Agriculture is their main occupation. Other sources of income include agricultural labour and NTFP collection.

Kharevokkaligas are forest dwelling communites dependent on NTFP for their livelihood. They manufacture handicrafts and articles from cane. Recently they have started cultivating paddy.

There are two *Shetty* families in the village. Agriculture is their main occupation. They grow paddy and areca in small patches of land.

Acharis are traditionally carpenters. They have small patches of agricultural land on which they grow paddy.

Siddi: Siddis are of African origin brought by Portuguese and are settled in the north-western side of the district. Collection of NTFP is their main occupation.

Hallers (Scheduled Caste) have very small patches of land. Collection of NTFP and wage earning are their major occupations.

Havyaks are high caste, have land and grow areca and spices. Some of them are employed in urban areas.

Table No: 5.1b

Population and Literacy in Achave cluster

Population	Manigadde	Kuntagani
Male	41	389
Female	93	931
Total	134	1320

Literacy

Particulars	Kuntagani	Manigadde
Male	54%	42.56%
Female	38.56%	36.85%
Total literacy	46.28%	39.7%
Above 10^{th} Std.	12.34%	5.92%

There is one Lower Primary School and Anganvadi (Nursery School) at Kuntagani. The nearest High school is about 15 kilometre away at Hillur and the nearest college is in Ankola.

Weaker sections: *Hallers* (SC) and *Kharevokkaligas* are the weaker sections in this cluster. *Hallers* are socially deprived and have very marginal land. *Kharevokkaligas* grow paddy, which is not a commercial crop. So, even though they own land, their economic condition is not good.

Table No: 5.1c

Dependency on forests by various communites in Achave cluster

Caste	Agriculture income	Wage	NTFP	Others	Income	% NTFP
Achari	4000	0	75	15000	19075	0.39%
Havyaks	15000	0	763	0	15763	4.84%
Kharevokkaliga	1953.33	3433.33	1754	333.33	7473.99	23.47%
Haller	1115	7100	1535	0	11950	15.616%
Nayak	8000	0	1183.33	450	9633.33	12.28%
Siddi	2000	3000	830	0	5830	14.24%
Shetty	8000	0	50	0	8050	0.62%
Others	6000	5250	875	0	12125	7.22%

Occupation: In this area, the cultivable land is limited due to the extensive forest cover. Therefore, agricultural activities contribute only 21% of the total income of the families in the sample population. Paddy is the main crop grown in the region. Most of the families, irrespective of caste or class earn some amount of income from paddy. In the entire sample, only 12 families out of the 55 did not earn any income from paddy cultivation. However, the area under cultivation is not very large and most of the families have small to medium size land holdings. While 9 families have land holdings of 10 gunte (cents) to 30 guntes. The rest of the land-owning families possess approximately half, one or two acres each.

The most important income source of the villagers in Achave cluster is wage earning, which accounts for 44 % of the total income of the villagers. Most of the families have members capable of working. In fact, of on an average 4.36 members per household 1.31 is in the productive age group and capable of working

Despite this, there were 11 families out of the total sample of 55 where none of the members were wage earners.

While wage earning contributes to 44% of the total income of the sample studied, the income earned from the collection and marketing of NTFP is 19%, not far behind that earned from paddy cultivation i.e. 21%. Every family in the study cluster depends on NTFP for their income to some degree. The income that different families earn from NTFP range from Rs.500 annually to Rs.6,000. Most families earn somewhere between Rs. 1000 - 3000 per annum from NTFP collection and marketing. This cuts across all caste and class groups though the upper castes depend on NTFP to a lesser extent as will be seen later.

Eight percent of the total income of the villagers studied in the Achave cluster is from arecanut cultivation and other sources like growing coconut and some spices. Very few families earn income from other sources. Only 5 families out of the total sample of 55 earned an income from sources other than paddy or arecanut cultivation. NTFP sources and wage earning. The proportion of this income to the total income of these 5 families was quite substantial. Though four out of these five families grew paddy and one also grew arecanut, their income from other sources was much higher - usually more than thrice earned from paddy cultivation. However, these families depended to quite an extent on NTFP though the proportion of their NTFP income to income from other sources was still low.

2.0 FOREST ECONOMY

Relation with village/regional settings: The forest had close connection with the regional settings. Several forest products are being used for various purposes. An analysis of the dependence of the communities on NTFP in proportion to the income they earn from other sources substantiates the findings in the other clusters. Thus, though agricultural income and NTFP income form almost equal parts of the total income of the villagers i.e. 21% and 19 % respectively, it can be seen that as agricultural income increases, the percentage of NTFP income to agricultural income decreases. Therefore, for those who earn less than Rs.10,000 per annum from agriculture, they earn 23% of their income from NTFP collection and sale. Whereas those on the upper income scale depend on NTFP to a

much lesser extent. It should be noted that contrary to the trend those who have no income from agricultural sources earn 21 % of their income from NTFP. This is 2 % less than those who earn an income (below Rs. 10,000) from NTFP. This could be attributed to the fact that those who earn small amounts of income from agriculture have very small land holdings and are highly dependent on NTFP.

Table No: 5.1d

Income range and contribution of NTFP in Achave cluster

Total Income v/s NTFP	
Total Income	%NTFP
Below 10000	23%
10000 to 25000	20%
25000 to 50000	2%
50000 to 10000	0
One lakh and above	0

Agriculture income v/s NTFP	
Agriculture income	%NTFP
Nil	21%
Below 10000	23%
25000 to 50000	12%
50000 to 10000	0%
One lakh and above	0%

The same trend can be observed when analysing the data on income from wages v/s NTFP income. Families earning an annual income of below Rs.5000 earned 26% of the NTFP income v/s their wages, whereas those in the income range of more than Rs.10,000 per annum depended on merely 11 % of NTFP income in proportion to their total income from wages.

The analysis of the data on total income v/s NTFP income corroborates the findings in other clusters. The only family in the Achave cluster, which earns more than Rs. 25,000 per annum, depends to a very small degree on NTFP i.e. NTFP collection and sale forms only 2% of the total income of this family. On the other hand, for families earning a total income of Rs.10, 000 and below and between Rs.10,000- 25,000 the proportion of NTFP income to total income was 23% and 20% respectively.

Role of forests in agriculture:

Agriculture is totally dependent on forest resources. Agriculture implements were prepared using only the forest products. Farmers were using wooden ploughs usually made up of *Halasu* (Jackfruit), *Hebbalsu,* and *Honne* trees. Yoke is prepared by *Shivane* tree. Leveler is prepared by baine tree. And the rod is from *Karikumar* plant to fix the leveler with the yoke.

Fencing poles are prepared by *Baine* (palm), bamboo, and from some other trees. Fibres

were made from more than 25 types of climbers for various purposes and from more than 15 plants for agriculture purpose for fencing work. For tying poles in constructing huts.

Manure: farmers depend only on forest for manure. To apply to their agriculture land. Dry and green leaves and rotten leaves from the stream are collected in different seasons. Fodder is collected to feed the cattle; to cover the sides of the trenches in areca garden as much and as well as to prepare manure mixed with dry leaves green leaves cow-dung and urine.

Mats are prepared from the Vaate reeds and from bamboo to use in various agriculture purposes. *Kukkarasana balli* (a climber vine) is also used make mats. Baskets of various sizes are made mainly from cane and sometimes from locally available climbers to use it for various agriculture purposes. To store the food grains, etc. mats prepared by *ichalu* (palm tree) is used in other household purpose.

Cattle feed: *Kanagalu, Bachchalaballi, Akkaballi, Urusanaballi, Atti leaves*, D*adasalu, Honne leaves*, and other fodder species are use as fodder. Cattle are allowed to graze in the forest and *gomals*. The cattle feed was never brought from the market.

Bio pesticides: M*ukkadaka, Paragi, Mundige, Lakki, Dalchini leaves* are used as bio pesticides to control several diseases and other crops. *Karada*, a grass grown in the gomals, is used to control the fungus attack to the areca nut fruits, during rainy season. The grass is tied to safeguard the bunch of arecanut from the heavy rain.

Later, this was again covered by the hard leaves of arecanut prepared artistically for the work. This practice is abandoned since last two decades.

Role of forest in other house holds activities: Preserving food grains: paddy is stored in bamboo mats or in "*moode*", a specially made arrangement from paddy straw and canes. *Lakki* leaves are placed with the paddy to preserve it from the attack of pests. Rice and other food grains are stored with dalchinni leaves.

Brooms*: Tegasu, Jiddi hullu, and Ichalu* are used in preparing brooms.

Food security: only few things are brought from market to be used in food preparations. More than 95% of their need for food is obtained from agriculture and from the forest.

Medicinal plants: villagers depend on the traditional medicine to cure most of the diseases. Each member of village knows at least some plants for treatment of common diseases.

Dependency of weaker sections on forest for NTFP: As discussed earlier the weaker sections depend on NTFP for both commercial and consumption uses. They collect about seventeen types of NTFP for commercial purposes. All farmers use manure, fodder, fuel wood etc from the forest for domestic use. Cane is collected for making handicrafts. Cane articles like baskets, (*butti, kanaja, chabbe, manki,* and many more) are sold to landholders, neighboring villagers etc. Price of these products varies from Rs 25 to 200 depending on the size.

State of the forest:

Logging - Fifteen years back the KFD (Karnataka Forest Department) has logged the forests to remove dead trees. Villagers opine that the contractors have cut not only the dead and fallen trees but also several green trees. They established roads inside the forests to transport the timber. Also, in the process of cutting the dead trees, some other trees including NTFP species were damaged and destroyed. The logging activity has adversely affected the NTFP resources in the region leading to decrease in the availability of NTFPs.

3.0 History of NTFP collection:

In 1950: The population has gradually increased in the village. Many of them came here as wage laborers to cultivate land as share cropers. Hebbar family gave certain land to each of these labour families on lease. After the Land Reform Act in (1979), these share cropers became the landowners. Along with them many outsiders from neighboring villages like Hillur and other have have also settled here by encroaching the forests.

A road is built in the village, which connects the village from other trading centers like Ankola and Madanageri. Due to this road the village has good communication. Ox-driven carts and a motor vehicle owned by an outsider started to transport goods to the village.

Commercialization of NTFP: After the road was built the market for the forest produce increased. Almost at the same time government, i.e., KFD gave contract to harvest cane, *Dhoopa, Gulamavu, Rampatre, Dalchinni* leaves and honey. *Vittal Raya,* a trader in the Hillur village, started purchasing some of the NTFPs. The market for cane articles increased.

After some years, NTFP like cane, *Seege, Vaatehuli*, have found market demand. Wild pepper was abundant and sold to middlemen.

Uppage, Murugalu, Cane articles, *Vaatekai, Seege, Antwal,* etc are the NTFP that has now become commercial NTFP. As the road and communication facilites to the village has improved, the villagers are exposed to the outside world of commercialisation. The dealers of NTFP reached the village.

4.0 PRESENT STATUS OF NTFP

The bark of *Kachu (Acacia catechu*) tree was boiled in water to extract *Kachu* (An additive in *pan-masala.*) A small-scale industry to extract *Kachu* was present in the village about 10-year back. They collected barks of tree to extract *Kachu* for several years. Continuous use and unscientific method of harvesting of the bark has resulted in extinction of this species in the region.

Collection of *Uppage* started about 15 years back. Before that, villagers collected the seed to extract oil. However, as the price increased, more and more villagers started to collect it from the region. Nowadays the neighbouring villagers have also started to come. They come in-groups of five to ten and stay in the forest for a week. They harvest the fruits as much as possible without caring for the quality of product. Afterwards they dry the rind by collecting the fuel wood from the forest. In the process of collecting they cut the trees and branches of trees and also unripe fruits.

About thirty years back the village never marketed a single NTFP now it sells hundreds of quintals of different NTFPs.

Dependence on consumption NTFPs: The starting of bus to the village from Gokarn, Kumta, and Ankola has brought several changes in the village. It was around fifteen years back. The dependency on consumption NTFP has considerably decreased whereas the harvesting of commercial NTFP has increased both in number of NTFP and in quantity harvested. Increased contact with other trading centres has decreased the dependency on consumption NTFP.

Villagers are interested in allopathic medicines even for small ailments, diseases. Dependency on traditional medicines using locally available plants, roots, has considerably decreased. The present trend is to go to the Nursing Home for childbirth, which was earlier restricted to the care of village midwife, and herbal medicines.

The villagers started to purchase agriculture equipments, chemical fertilisers , chemical pesticides, and cattle feed.

Earlier, villagers were using several fibres for agricultural purposes like fencing, building houses etc. But today glazed iron wires charged by batteries have replaced the fencing. *Senabu* (jute) is replaced by plastic thread.

When we look into community wise dependency on consumptional NTFPs Brahmin community is more dependent on consumptive NTFP. This community is using about 75 NTFPs for their household requirements. In which medicinal NTFPs are 44, edible NTFPs 23 and nonedible 10. Hallers are the second highest community that depends on consumptive NTFPs. They use 74 consumptive NTFPs, in which medicinal NTFPs are 42, edible 17, and non-edible NTFPs 15. Achari community is least dependent on consumptional NTFPs. They are using about 33 NTFPs for consumptional requirements.

5.0 MARKET VALUE OF NTFP COLLECTED

Table No.5.1e

Income from commercial NTFP in Achave cluster (1998-99)

Product	Quantity	Income (Rs)
Uppage	12000 kgs	780000
Murugalu	2500 kgs	75000
Seege	1500 kgs	11250
Vatehuli	100 kgs	3500
Ramaptre	150 kgs	16500
Cane	1000 nos	2500
Suragi	35 kgs	2450
Honey	65 kgs	3250
Antwal	400 kgs	3200
Dalchinni moggu	10 kgs	750
Hedahagala patre	250 kgs	20000

Marketing channels:

Contractor system is operating in the village. The villagers market small quantity of honey in Gokarna, (a famous pilgrim Centre) to consumers and through the middlemen in the urban areas.

Market for new prodcuts of NTFP: Suragi and Uppage, Murugalu and Cane articles are some of the NTFP that has demand. Cane articles are necessay for the consumptional needs of villagers. But, nowadays as the demand has increased and the price for the articles is higher than what the villagers can afford Artisans prefered to sell it outside the

village for higher price. Earlier only *Uppage* seeds was used in households to extract oil. But nowadays rinds are collected as a commercial NTFP.

6.0 Harvesting of NTFPs

Pressures and destruction: The case of *Kachu* tree as explained earlier has been over exploitated and the tree can be hardly seen in the village. About 15 years back *Cane, Dalchinni leaves, Dalchinni bark, Halamadi, Dhoopa* were given to contractors. Contractors overextracted this and it resulted in reduction in number of these species in the natural forest.

As price of *Uppage* increased, people from neighbouring villagers started to come for collection. Some of such collectors stay in the forest for about a week or so to harvest as much as possible in minimum time. They collect by cutting the trees, branches, and also unripe fruits. The over harvesting and destruction of the resource is common.

7.0 Legal/Tenurial Issues

Legal status: The village is surrounded by reserved forest. Privilege of *betta land* is available for few families. The narrow belt of forest around the land of farmers is marked by boundaries. The owner of that land collects NTFP in this region.

Problem of ownership rights: People from outside village come here and collect the NTFP from this region. They come to the forest of the village and stay there for about week or so. They collect maximum quantity of NTFP in short time. In the process, they even cut the trees also. There is conflict over the use of the forests by villager and outsiders.

8.0 Gender and NTFP Collection

Income earned by collecting NTFP like *Ichalu* mat, brooms are used by women members only. However, decision making in spending the money earned from major commercial NTFP like *Uppage*, *Rampatre*, Dalchinni etc is taken by men (74.25%). Collection, processing and cooking of consumptive NTFPs is done by women.

Marketing is done by men, especially elder member.

The following data is calculated from the data collected in the cluster from last two years from 40 families.

Table No: 5.1f

Gender and NTFP collection in Achave cluster
(Average no of hours spent in collection in a year)

	Men	Women	Children
Commercial	468.18	398.65	126.35
Edible	31.69	118.25	16.51
Non edible	211.48	215.86	46.75
Medicinal	19.52	8.24	8.62
Total	730.87	741	198.23

Decision making while marketing NTFP

Men	Women	Both	Children
74.25%	9.55%	14.00%	2.20%

Money from NTFP is used for

Particulars	%of responses
Family expenditures	44.00%
Personal use(men/women)	39.42%
Not known	16.60%

In collection of commercial NTFPs, men and women participate almost equally. Men and women spend 468.18 and 398.65 hours in a year respectively. Edible NTFPs are collected mainly by women. They spend about 118.25 hours per year in this activity. Since, most edible NTFPs are available near the house and are collected while coming from the daily work or in spare time, the collection time is less.

Money from the marketing of commercial NTFPs is used by the family, (44.00%).

Figure 5.1 Proportion of income from different sources among different communities in Achave cluster

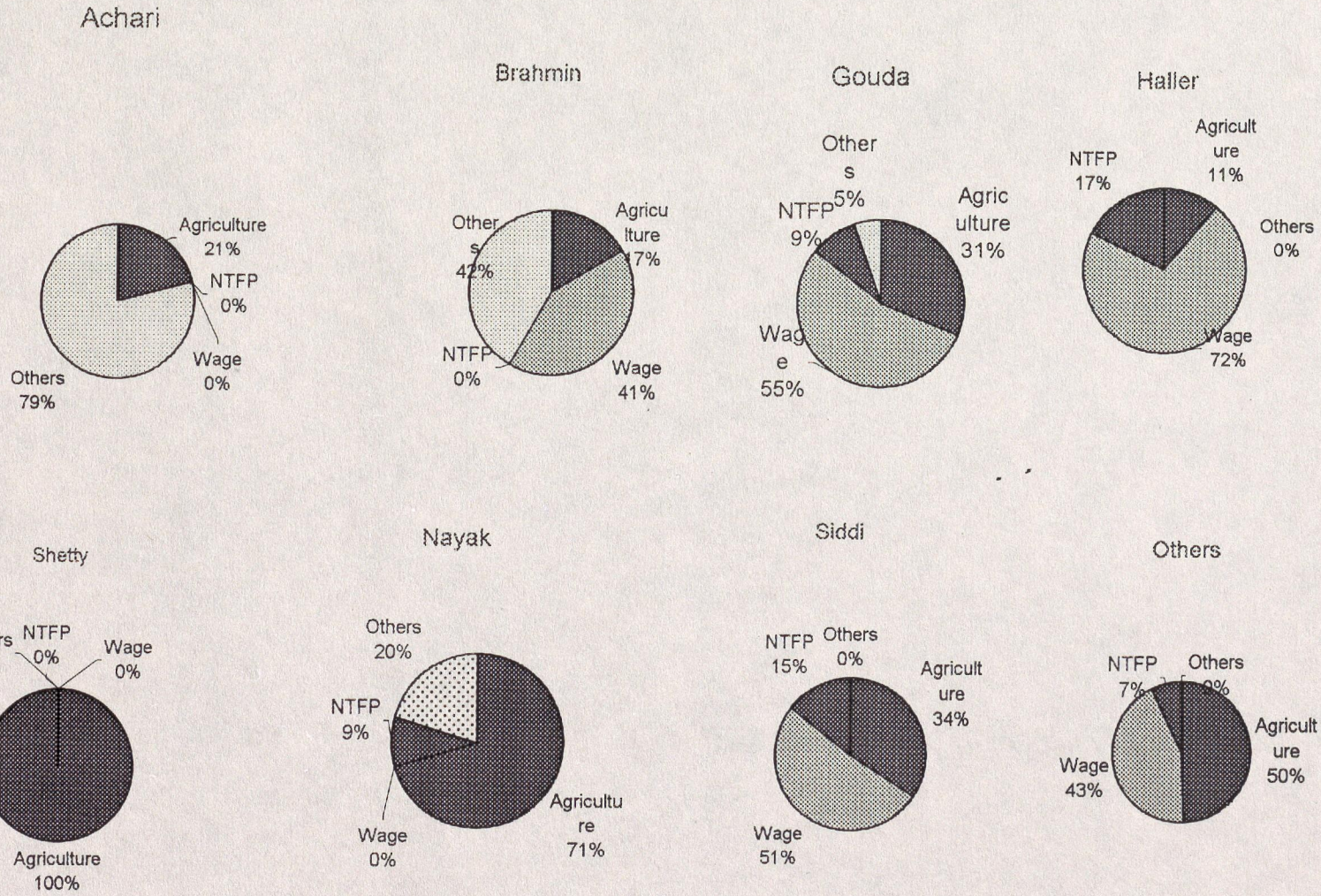


Figure 5.2 Contribution of NTFP income to the total income in Achave cluster

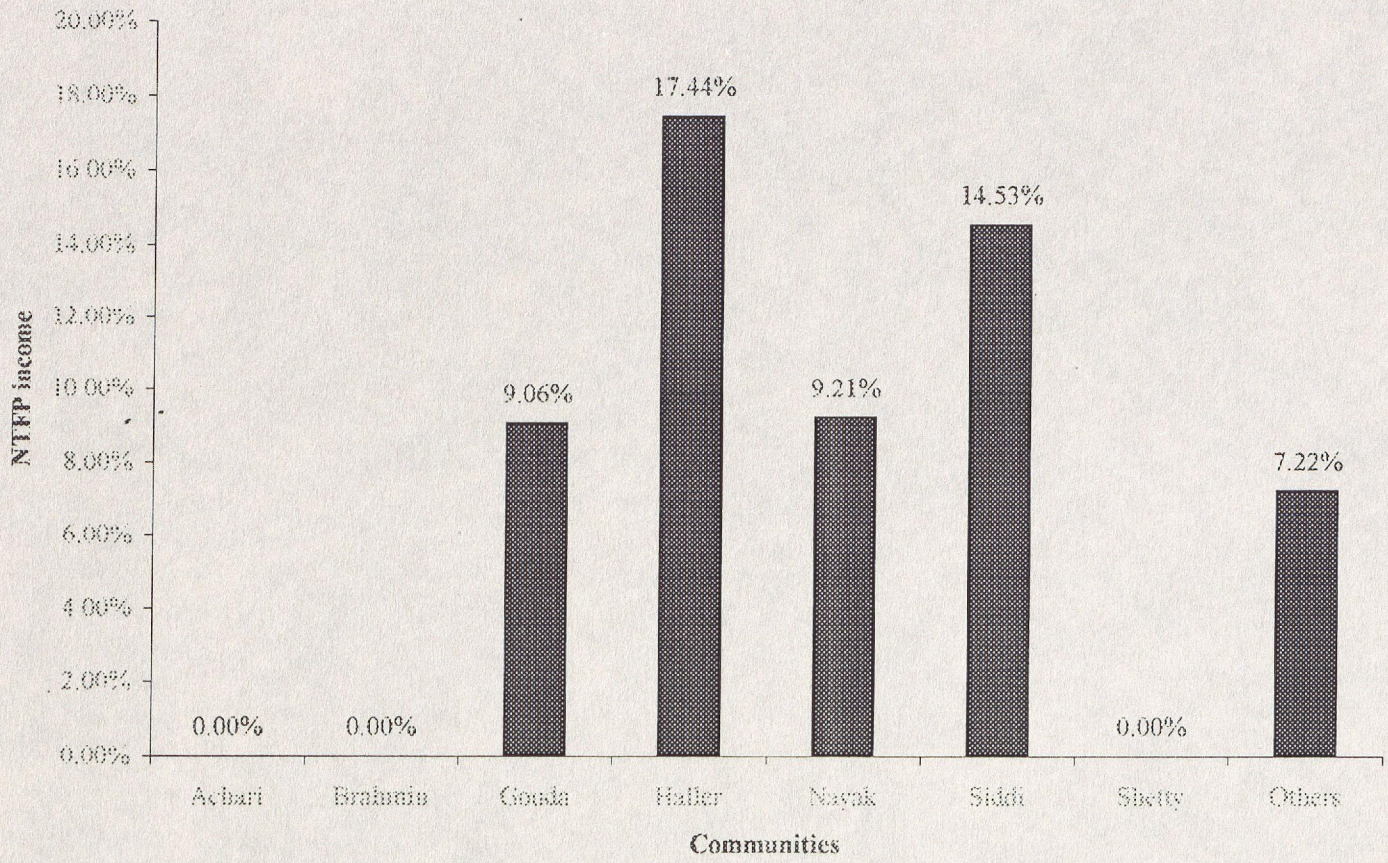
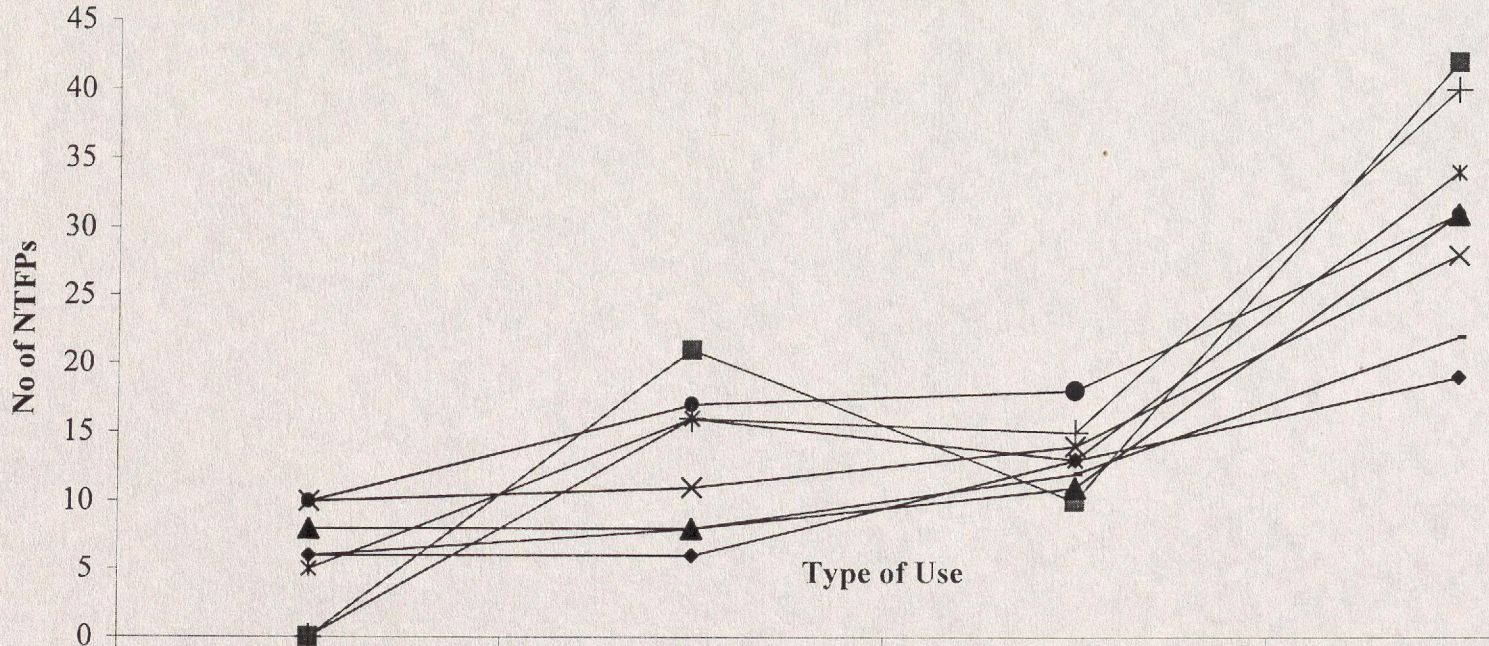


Figure 5.3 Type of NTFPs collected by different communities in Achave cluster



	Commercial	Edible	Nonedible	Medicinal
Achari	6	6	13	19
Brahmin	0	21	10	42
Gouda	8	8	11	31
Haller	10	11	14	28
Nayak	5	16	13	34
Siddi	10	17	18	31
Shetty	0	16	15	40
Others	6	8	12	22

2.0 ANSHI CLUSTER

1. Description of village and region:

Anshi is situated in the northernmost part of Uttara Kannada District. It is part of Joida taluka, the most sparsely populated taluka in the district. The river Kalinadi separates Joida from the rest of the district. This area is mainly covered by evergreen tropical forests. The two villages selected for the study are Barade and Anshi.

Table No: 5.2a

Land use in Anshi cluster

Area in acres	Anshi	Barade
Total Geographical area	4589.25	5248.65
Forest area (Approx.)	4000.00	5000.00
Agriculture area	589.25	248.65

Description of communities: The village comprises the different communities that inhabit the area. These include *Kunbis, Desai, Madival and Devali*. Like in other regions there are a few families belonging to the upper castes.

Desai are the upper castes mainly owning land and agriculture as the major income source. They are slightly better off than the *Kunbis*, another communities predominantly living in the region. *Devali and Madivals* have migrated from the coastal region. They are living on other sources like small Shop, Hotel etc.

Table No: 5.2b

Population and Literacy in Anshi cluster:

Particulars	Anshi	Barade
Population	160	89
Male	88	41
Female	72	48

Literacy

Particulars	Anshi	Barade
Male	32%	42%
Female	24%	28%
Total	28%	35%
10^{th} std. And above	12%	4%

Weaker sections: *Kunbis* are the weaker section communities residing in the region. They own meagre land, and have to migrate in search of employment. As the rainfall is high (i.e. average annual rainfall is around 5000 mms), land is less fertile. They grow paddy along with some food grains. Employment opportunity is low. They migrate to Goa, the neighboring state or to Dandeli, nearby town in search of employment. They prefer to migrate to Goa in the lean season, i.e. December, January, and February, as there is comparatively high wage in Goa.

Dependency on forests: Collection of NTFP provides employment for about three months in a year. Before commercialization of some of the NTFP of this region, villagers migrated in search of employment. However, at present most of the villagers feel that collections of NTFPs like *Rampatre, Vatehuli*, Honey, *Uppage, Dalchinni* provide considerable income to these communities (*Kunbis*). The people live midst of the forests and they depend on forests for survival.

Occupation: Agriculture, NTFP collection, and wage earning are the major occupation in this cluster. The months of June, July, November, December, are mainly agricultural season. NTFP collection is done during April, May, July, and September. In this cluster, 8% of the population belongs to the upper income group, i.e. they earn between Rs. 50,000-1lakh per annum. About 15% belong to the slightly lower income group, i.e. Rs. 25,000-50,000. As in other clusters, the vast majority of the population sample belongs to the lower classes. Here, 54% fall in the Rs. 10,000-25,000 per anum range. A sizeable proportion of the sample are very poor in this are, i.e 23% earn an income of less than Rs. 10,000 per year. It was observed that most of those in the upper income ranges earned their income from all the sources mentioned above, i.e. paddy cultivation, NTFP collection and wage earning.

The major income source of the villagers in this cluster is paddy cultivation followed closely by wage earning. All except one family in the sample are engaged in paddy cultivation. The land holdings are, however, quite small, ranging from half an acre to 8 acres. Six families in the sample own 4-6 acres and another 6 owned 7-8 acres. The rest of the families i.e. 35 owned 1/2- 3 acres. The range of income earned by the families was from Rs. 13000-16,000 per year. Most families come under this income range.

While most of the families who earn an income from agriculture depend on paddy cultivation, a few grow other crops as well. However, this does not add substantially to the overall income from agriculture. The only family with no land depends on wage earning and NTFP collection for their income.

Wage earning contributes about 34% of the total income of the villagers in Anshi. This is quite high considering the fact that opportunities for wage earning are limited in this cluster. Many people go to the neighboring areas in search of employment.

Still, not all families depended on wage earning for even a part of their income. The distribution range in terms of income through wage earning is much wider than that from paddy cultivation. Thus, families earned wages ranging from Rs.1200-24,000. Also, a sizeable proportion of the sample did not earn any wages, i.e. 19 out of the 49 families, almost 39% of the population.

Moreover, it does not appear that there is any correlation between wages earned and dependence on paddy cultivation. This seems contrary to general trends wherein the more people are dependent on agriculture, the less they rely on wages. The situation in this region is probably different because of the fact that wage-earning opportunities are not available near their homes. This means that the members of the family capable of working have to migrate to the neighbouring states in search of work. Those who are left behind are engaged in paddy cultivation, which in any case does not need too many hands considering the small size of holdings.

The third source of income in order of priority is NTFP collection and sale. This accounts for 23% of the total income of the families in the study sample. Like in the other clusters, there is not a single family, which does not depend on NTFP for at least a part of their income. The NTFP available in this area include Honey, Wild pepper, *Seege, Wate, Rampatre, Dalchnini, Soapnut, Murugalu, Suragi, Uppage, Cane, Naaru, Sapol, Char char konde, Mushrooms, Vartegende, etc.* The income that an individual family gets from these resources ranges from Rs.1000-15, 000, a very wide range contingent largely on the type of NTFP collected and marketed. What is peculiar to this cluster is the system of tenurial security.

Finally, a mere 6% of the total income of the sample population is obtained from other sources. In fact, only 4 families earned any such income.

2.0 FOREST ECONOMY

About 23% of the family income come from collection of NTFP. *Cane* (Rattan) weaving is the one of the major occupation of villagers. Recently *Uppage* and *Dalchinni* have become major commercial NTFP collected in the village. This has increased the income from forest products in comparison to earlier days. This is because of the high demand, and increased price of these products.

Role of forests in agriculture: Paddy is the major agricultural crop. All agriculture implements are made from trees in the forests. Plough, handles of sickle are made from forest products. Traditional knowledge of protection from pests like spraying mukkadaka and using thorny bushes. To remove insects plant based pesticides are practiced in the village. Green manure is mainly used for paddy fields.

Dependency of weaker sections on forest for NTFP: Kunbis are the weaker sections living in the village. It is found that they get about average of 85 days of employment through collection of NTFPs. Collection of NTFP contributes about 42% of total income of *Kunbis* (23% of the total income of village).

State of the forest: Anshi has evergreen type of tropical forests. Encroachment of forest land common in the region. Most of the irrigated land is encroached and converted into paddy fields.

As part of WGFP, VFC s is formed in the region. near the village *Acacia auricliformis* plantation has been raised. Logging is not done since last ten years. However, there is continuous illegal timber felling in the region every year.

***3.0 History of NTFP collection*:**

In the past, only Honey and the Vatekai were collected in large scale by the villagers. Wild pepper, Rampatre and Baine kallu (wine from *Caryota urens)* are some other products.

Collection of these NTFP has started about forty years back. Earlier to that collection was done only for consumption purpose. Tubers like *Pirasi* are used as a staple diet.

Change in listing and commercialisation: Uppage and *Dalchinni* have been introduced to the villagers only recently. Agents from Kumta, a small town in southern part of District, came here and motivated the villagers to collect *Uppage* and *Dalchinni.*

4.0 PRESENT STATUS OF NTFP

Description of present situation:

Information regarding the dependence on NTFP and its relation to other sources of income was analysed. The conclusions of the analysis in other clusters were further substantiated here. As the total income of a family rises, the dependence on NTFP decreases. For those with an income of less than Rs. 5000 p.a. NTFP income contributed to as much as 50% of their total income. The reliance on NTFP decreased as one went up the income scale so that NTFP contributed to 29% of the total income of those earning between Rs.20, 000-50,000 p.a.

The same applies when an analysis is made of the agricultural income versus the percentage of the NTFP income. For the only family with no land, the dependence on NTFP was very high, amounting to as much as 83%. Whereas the dependence on NTFP showed a small decline from 40% to 37% for those in the medium income ranges, i.e from below Rs. 10,000 to Rs.10,000-25,000. This shows that there was a relative uniformity in NTFP dependence across the income scales as compared to agricultural income. This is probably attributable to the fact that the income from agriculture across families is not widely dispersed and given the limited opportunities for livelihood, all families are relatively dependent on NTFP as compared to other clusters.

Table No: 5.2c

Contribution of NTFP income Anshi cluster

Total income of the family (Rs)	% of NTFP income
Below 5,000	50%
5,000 to 10,000	45%
10,000 to 25,000	41%
20,000 to 50,000	29%

Income from Agriculture	% of NTFP income
Below 5000	45%
5,000 to 10000	39%
10000 to 25000	31%
25000 and above	35%

Wage earning v/s % of NTFP income

Income from Wage earning	% of NTFP income
No wage earners	48%
Below 5000	35%
5,000 to 10000	35%
10,000+	35%

Land holding v/s % of NTFP income

Land area in Acres	% of NTFP income
No land	54%
0 to 1	45%
1 to 2	47%
2 to 3	43%
3 to 5	31%
5 +	34%

The same is true for wage earning versus percentage of NTFP income. Here again the data, though it does not contradict the other clusters, shows a very mild inverse correlation between wage earning and income from NTFP. Again, for all those who do not depend on wages for their income, the dependence on NTFP sources is quite high, i.e. 48% of their income, whereas the dependence on NTFP remained at a consistent 35% for those in the other income ranges from wage earning. This seems surprising as the income earned from wages is widely distributed across the income spectrum.

Finally, when analysing data on land holdings and percentage of NTFP income a clear trend was observed. This is despite the fact that the actual size of land holdings and the range of land are small, i.e. from 1/2 to 8 acre. Families having no land depended heavily on the collection and marketing of forest products, i.e. 67%. As the size of land holdings increases, the dependence on NTFP drops. However, there is a small rise in dependence on NTFP for those owning more than 5 acres of land. Therefore, those owning 3-5 acres depended on NTFP for 25% of their income whereas NTFP accounted for 38% of the income of those owning more than 5 acres.

Dependence on consumption NTFPs:

Pirasi is a tuber available in the forests of this region. They are used in food as the vegetable. They use *Mushrooms* of about eight types. Crabs, fish and wild animals also contribute in considerable amount to the local diet. During the rainy season, crab is common food for almost every family in the village. Wild animals like Wild Boar, Mouse Deer, Indian Hare, *Kabbekku*, Gaint squirrel, are hunted by the villagers.

5.0 MARKET VALUE OF NTFP COLLECTED

Market for new prodcuts of NTFP: *Uppage* and *Dalchinni* are the two NTFPs commercialised recently. *Uppage* collection started about four years back (1995) in Anshi and two years back in Barade.

A NTFP dealer in Kumta region informed villagers about market value. He purchased the product from villagers. However there is a competion among the middlemen to purchase NTFPs.

Table No: 5.2d

Income from commercial NTFPs in Anshi cluster (1998-99) :

Name of Commercial NTFP	Availability	Price/unit (Rs)	Approximate income (Rs)
Uppage	75 quintals	5000.00	375000.00
Honey	5quintals	7500.00	37500.00
Vatekai	5 quintals	3500.00	17500.00
Rampatre	3quintals	11000.00	33000.00
Dalchinni	1quintals	18000.00	18000.00
Cane articles	2000 nos	40.00	80000.00
Crabs	1000 nos	2.00	2000.00

Marketing channels: After declaring the region as National Park, no tender was given for collecting the NTFP. However, some middlemen have been purchasing the NTFP from this region illegally. Eight V.F.C.s (Village Forest committees) are formed in the region. These VFCs purchased the NTFP from collectors. The two main products marketed through the VFC are Cane articles and *Uppage*. Cane articles are collected from the villagers and sold in the Ulavi Fair, a famous festival of the region. Pilgrims come from all over the state. Initially only VFC of Ulavi was selling the handicrafts, purchased articles from other VFCs. However, this year (1998) VFCs sold their products in the fair and earned higher price. Villagers opine that the price they get through VFC is lesser than the price if they had sold directly to the customers.

Uppage was also collected by the VFC of Anshi and Barade. Dealers purchased *Uppage for* Rs 50 per kg. However, VFC decided to collect the entire NTFP collected from the region. Villagers were forced to sell *Uppage* to the VFC. However, after deducting the taxes to be paid to KFD (15% of total value), and expenditures towards transportation, villagers were given about Rs 35 per kg.

Villagers incurred a loss of Rs. 15/ per kg for having sold the NTFP to VFC.

About 25 quintals of *Uppage* was collected by the villagers of Barade.

6.0 HARVESTING OF NTFPs:

Pressures and destruction: Logging and collection of dead and fallen trees was done in the region about ten years back. After that logging ha been stopped.

Recently commercalised NTFPs like *Uppage* and *Dalchinni* are collected in unsustainable manner. Collection of unripe fruits and cutting of branches are obsrved during the last season. This happened also in the case of *Dalchinni.*

Possibilities of sustainable harvesting: Villagers opine that tenural security, as it exists for NTFPs like Honey and *Vate huli* can reduce the destructive harvesting.

7.0 LEGAL/TENURIAL ISSUES

The surrounding forest is declared as National Park. National Park rules and regulations ban the collection of NTFPs.

Some of the villagers have been living in the village from centuries, they do not have the title to their land. Villagers are worried that they might be evicted from the National Park.

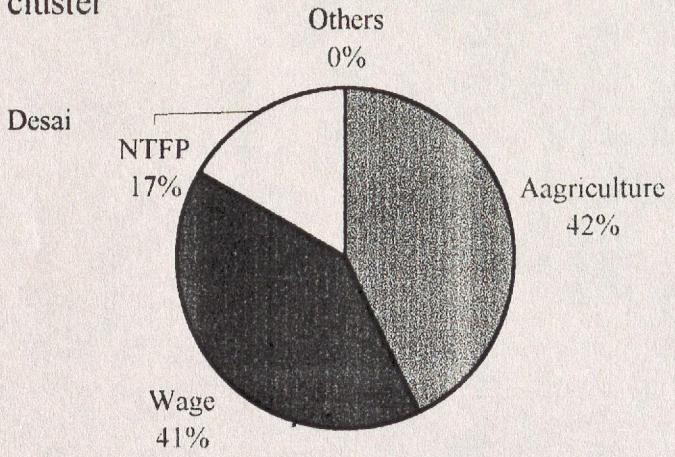
Honey and *Vaatekayi* are the two major NTFP collected traditionally. A typical tenurial system is operating for these two NTFPs. *Vaatekayi* trees in the forest is alloted to a particular person. That person can collect the fruits from alloted tree. In some cases, a single tree is given to number of people. In such cases the total fruits produced from the tree is distributed among them equally.

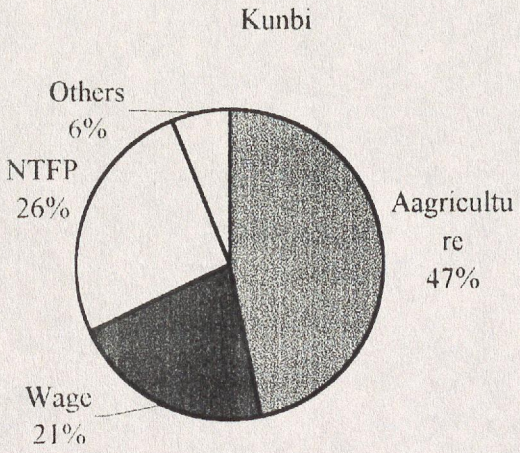
In case of honey the *pademara*, (host tree) is given to a family. The villagers mutually agree that only this family can harvest the honey. They worship the tree with coconut and flowers before collecting the honey. After harvesting, the members present at the time of harvesting gets the share.

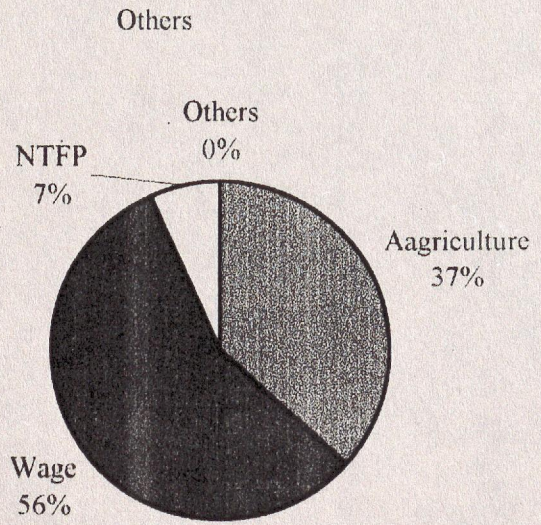
This type tenurial system provides security and helps in controlling the unsustainable harvesting of the NTFP. NTFPs that are commercialised in recent years like, *Uppage*, *Dalchinni* etc are not covered by this tenurial system. In cases of these NTFP, it is observed that harvesting is unsustainable, cutting off branches, and collecting unripe fruits.

Traditional beliefs and fear of god is one of the reasons for the success of this system.

Figure 5.4 Proportion of income from different sourcesamong different communities in Anshi cluster







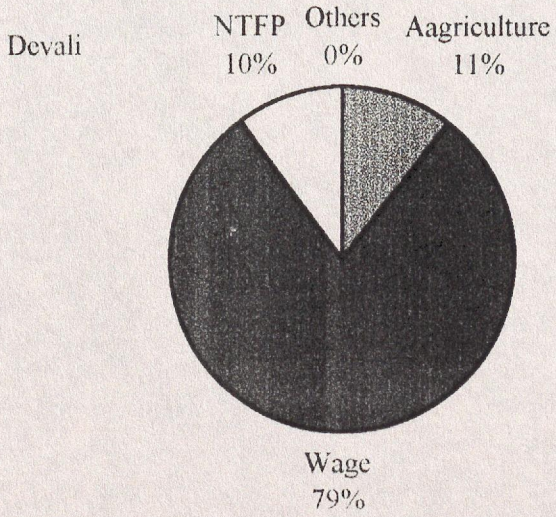


Figure 5.5 Contribution of NTFP income to total income in Anshi cluster

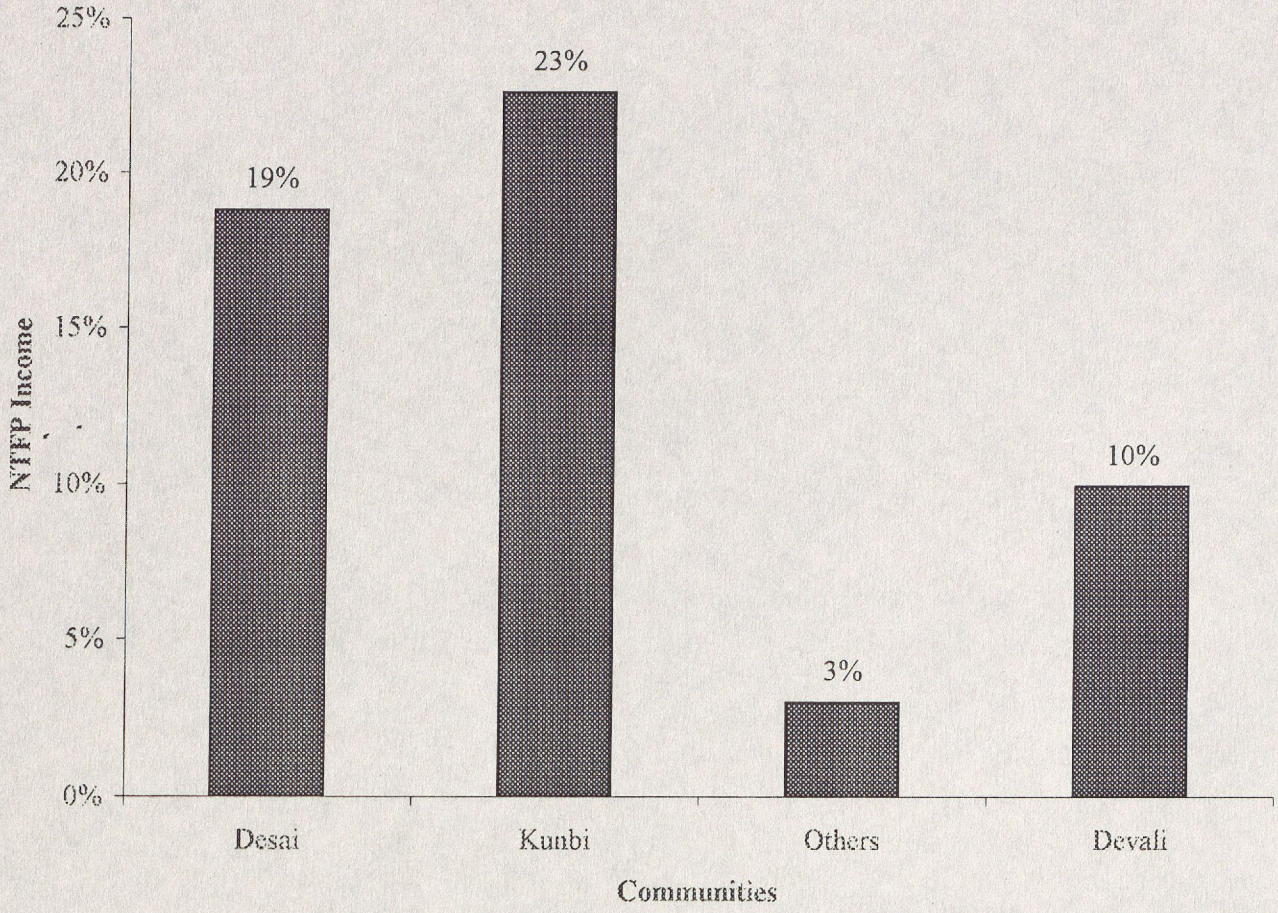
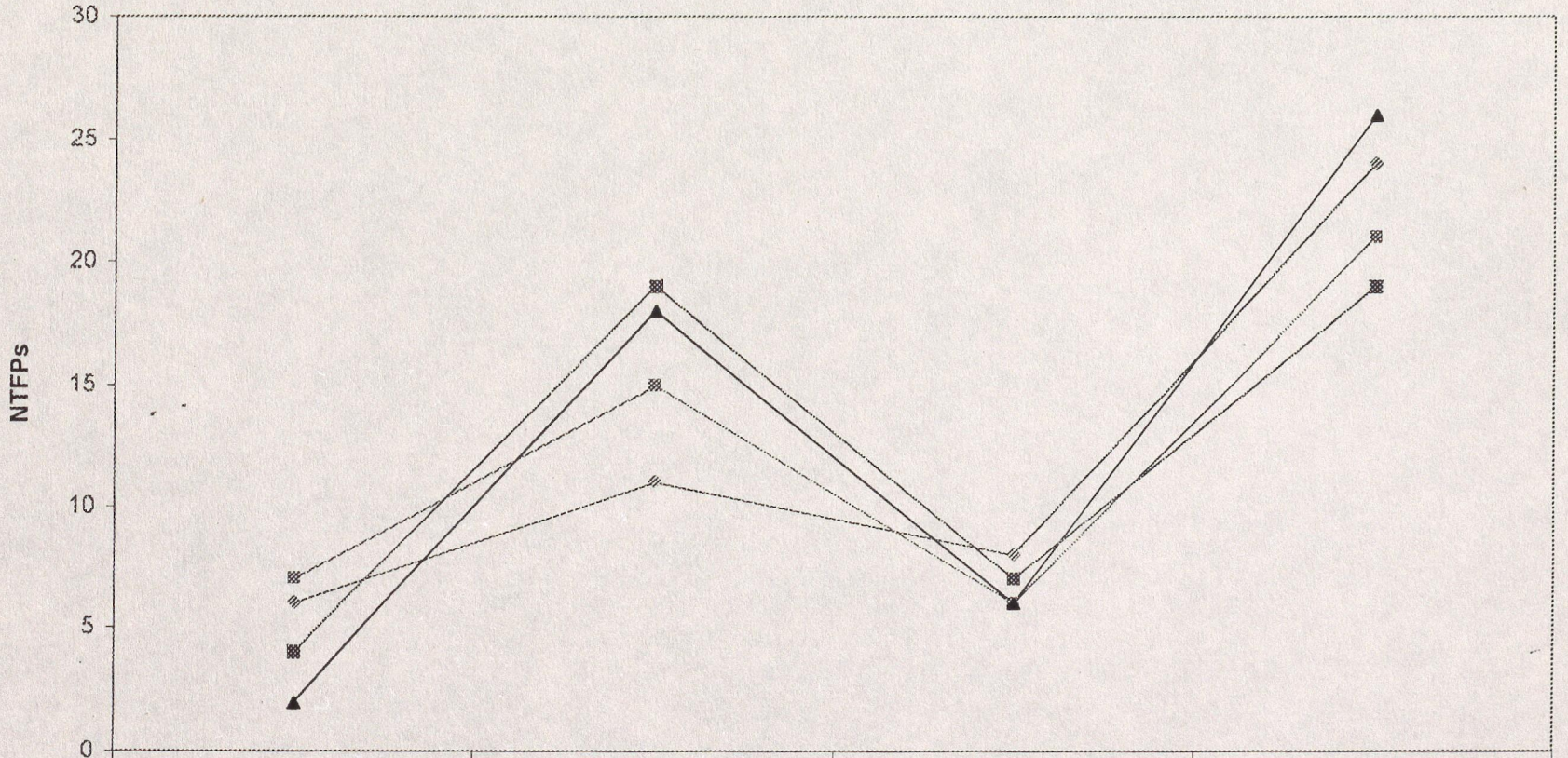


Figure 5.6 Type of NTFPs collected by different communities in Anshi Cluster



	Commercial	Edible	No edible	Medicinal
Desai	6	11	8	24
Kunbi	7	15	6	21
Others	2	18	6	26
Devali	4	19	7	19

Type of NTFPs

8.0.GENDER AND NTFP COLLECTION:

Table No: 5.2e

Gender and NTFP in Anshi cluster

Average no of hours spent in collection in a year

	Men	Women	Children
Commercial	326.87	257.62	56.21
Edible	215.18	157.38	26.31
Non edible	211.48	215.86	34.84
Medicinal	6.54	11.63	3.04
Total	760.07	642.49	120.4

Decision marketing

Men	Women	Both	Children
46.16%	21.63%	29.68%	2.58%

Money from NTFP is used for:

Particulars	%of responses
Family expenditures	61.34%
Personal use(men/women)	26.64%
Not known	12.02%

Unlike other clusters time taken by men for collecting consumptive NTFP is more. This might be because the time taken for hunting of wildlife is also included. In decision-making and in spending contribution of women is more. This is because of the tribal culture. In addition, it may be because, a NGO, Karwar Women and Children Development Society, is actively involved in the region.

3.0 BANDALA CLUSTER

1. Description of village and region: It lies to the south of Sirsi, about 30 kms from taluk headquarter and is situated on the crestline of Western Ghats surrounded by thick evergreen forests. It is a region of highly undulating hills, dropping rather steeply from hills ranging from 600 meters to 860 meters, which has resulted in a number of waterfalls.

The villages in the cluster were carefully selected to include a representation of the different communities residing in the area. The major communities residing in this area are *Kharevokkaligas* form 74% of the total sample. Compared to other clusters, *Brahmins* form a significant minority in the Bandala sample representing 15% of the total population. SC/ST, *Marathis*, and others are including *Muslims*, form about 5% and 3% respectively. In all, 65 families have been included in the sample.

Table No: 5.3a

Land use in Bandala cluster

Area in acres	Badagi	Mulgund
Total Geographical area	1689.12	2095.18
Forest area	1387.00	1829.8
Agriculture area	302.12	141.31

Socio-economic status:

Description of communities:

Havyak Brahmins: Farming is their major occupation. Experts in growing arecanut and spices.

Marathi- they have smallholding of agriculture land in which they grow mainly food crops. Agriculture labours, NTFP collection, value addition to certain NTFPs are the other occupations.

Muslims- Agriculture is the major occupation. Trading is the another important occupation. They collect only the major commercial NTFPs. They work as agriculture labour.

Table No: 5.3b

Population and Literacy in Bandala cluster:

Particulars	Badagi	Mulgund
Population	256	327
Male	111	169
Female	145	158

Literacy

Particulars	Badagi	Mulgund
Total literacy level	49%	35%
Male	56%	42%
Female	44%	28%
Above 10^{th} std.	26%	16%

School: Higher primary school: 2

Secondary Education: About 8 Kilometers

Higher Education: Sirsi, 26 kilometers

Weaker sections: *Harijans* (SC). They have very little land and are socially deprived.

Dependency on forests: Fibers: villagers use more than 12 climbers, barks of four plants, as fibers in fencing, construction of the thatched houses and for agricultural purposes.

Handicrafts: Cane baskets of various sizes and shape for specific uses of agriculture, are prepared by the villagers. Local names of these products are *Chooli, Butti, Hedige, Kuke, Mankri, Kalli, Akki Butti, Thottilu, Hachchige, Menasina Hachchige* etc.

Consumption: Out of 140 NTFPs collected in the cluster about 125 are used for consumptional purposes.

Occupation: Agriculture With vast tracts under areca plantations, income from areca accounts for 62% of the total income in this cluster. This is followed by NTFP collection, which is 13%, the only cluster in which this is the second highest source of income. Paddy cultivation forms a close third accounting for 12% of the total income.

As much of the land in this area is used for areca cultivation, not much is left for paddy. Also, areca requires intensive input both in terms of human and financial resources, leaving very little time and energy for other forms of cultivation. Moreover, while the

climate and soil are highly suitable for areca, the profits from arecas are much higher than that of paddy. Only 8 families in the entire sample i.e. 12 % did not earn any income from areca. For the others, income ranged from Rs.980-2,00,000 per annum.

More than 10% of the families belong to the upper middle class with 5% earning more than Rs. 1 lakh per annum and 8% between Rs. 50,000-1 lakh. 31% of the families belong to the middle to lower class with an income of between Rs. 25,000-50,000 per annum. As in all clusters, the majorities belong to the poorer sections of the village, i.e. 50% earn an annual income of between Rs. 10,000-25,000. And typically, a small percentage, i.e. 6% is really poor with an income of less than Rs. 10,000 p.a.

It was observed that the upper *castes* were also the better off sections of the village both in terms of income and standard of living. Therefore, the dependence on NTFP was also higher among the lower *castes* in the village as compared to the extent of dependence of the upper *castes*. From the table below, it becomes obvious that while the *Brahmins* relied on NTFP for 3% of the income, the collection and sale of NTFP formed a significant portion of the income of the *Kharevokkaligas*, the *Marathis* and the Harijan communities, viz. 15%, 22% and 37% respectively. NTFP sources contributed 2% of the total income earned by other communities.

This was the only cluster where it was found that one family did not rely on NTFP at all as a source of income. This family obtained all its income from other sources including paddy and areca cultivation, wage earning. In a later report, through other forms of data collection we will record the nature of this family's dependence on NTFP for subsistence use or for cultural and medicinal purposes.

Landless families relied heavily on forest products. Out of their toal income 48% came from NTFP. This dependence steadily dropped as income from agriculture rose. Therefore, for those earning Rs. 50,000-1 lakh and above Rs. 1 lakh, NTFP sources contributed a mere 5% and 1% of their total income.

Contrary to the findings of the other clusters and data from other studies, the data from Bandala cluster on wage earning versus NTFP shows a distinct correlation between the two. In the other clusters, it was clear that the higher the wages earned by families, the less the degree of dependence on NTFP. However, in this region those who did not earn any income through wages relied on NTFP for only 14% of their total income as against

those who earned between Rs. 5000-10,000 and above Rs. 10,000. The contribution of NTFP to the total income of these latter 2 groups was 32% and 31% respectively.

2.0 FOREST ECONOMY

Relation with village/regional settings:

The village is situated on the crest line Western Ghats. Out of 1387 acres of forests, there is about 1,000 acres of undisturbed forest in the village. In addition, the range of NTFP species is very wide. This evergreen forest supports species like 1] *Uppage*, 2] Murugalu, 3*] Wate, 4] Suragi, 5] Ramapatre 6] Alalèkai* 7] *Antuvala* 8] Honey 9] *Kalale* 10] Mushrooms, 11] Cane 12] *Ichalu* 13] *Baine* 14] *Bareballi, 15*] *Dadasalu* 16] *Dhoopa* [*Maddi and Saludhoopa*]. It is interesting to know that the price for NTFP available in this evergreen forest is much higher than that in other type of forests.

The range of income earned from NTFP was Rs. 1,000-12,000 per annum. The only family earning more than Rs. 10, 000 on NTFP did not engage in either paddy or areca cultivation. Apart from NTFP, wage earning was the only other source of income. Wage earning opportunities are limited in this region due largely to its geographical location. Also, the opportunities to search for wage earning beyond this region are restricted as travelling time and the location of the region on the Ghats makes it relatively inaccessible to other areas where potential for wage earning exists. More importantly, income from areca reaps in far more profit than that of wages, which is why those who do have opportunities to travel beyond the village prefer not to do so in favour of areca cultivation. 28 families, i.e. 43% of the sample did not earn any income from wages. Therefore, income from wages contributes only 9% of the total income, much lower than the contribution to total income from this source than in other clusters. Other sources contribute a mere 4% of the total income of the households in the Bandala sample.

Role of forests in agriculture: Manure: Green leaves are collected from more than 15 species of plants. Dry leaves are collected from the natural forests. *Kangobbara*, i.e. fertile soil mixed with rotten leaves, available in forests is collected to be used as manure. Cattle feed: *Mura*, local name for the cattle feed, is prepared by mixing grasses, fodder, climbers and green leaves of certain plants, with bran of wheat or rice.

Agriculture implements: *Negilu* (plough), *Noga, Koradu* (=leveler), etc are prepared from several species of plants.

Bio pesticides: For pest control the farmers use *Mukkadaka, Lakki, Nelli, Thumbe* etc. At present these practices are not followed giving way to pesticides.

Dependency of weaker sections on forest for NTFP: Brooms of *Ichalu* is prepared by Schedule Caste families. They have small patches of land in which they grow paddy. Manure, cattle feed, fuel wood, are collected from the forest. But they are dependent more on commercial NTFP like *Uppage, Rampatre,* and H*arda.* They prepare mats from *Vate* (*Ochlandra rhedii*) and Bamboo. This contributes a major source to the income of weaker sections.

General conditions of the village

State of the forest: Encroachment is one of the major threats to the forests of this cluster. Increase in population, need for cultivable land has resulted in the encroachment of the forests. Valleys are converted into cultivable land. Assurances of politicians and government policy of regularising the encroached land are encouraging the encroachments.

Logging: About 20 years back, KFD gave contract to harvest dead and fallen trees. In the name dead and fallen trees, several green trees were also cut. Villagers opine that these contractors made the roads into the deep tropical forests to carry the timber.

Monoculture plantations: Forest Department has recently raised acacia plantations. For this they clear felled the under growth of the natural species, in the process destroying several NTFP species.

Commercialization of NTFP: The analysis of data regarding contribution of NTFP to the total income of villagers does not reveal anything new. The higher the income of a family, the less the dependence on NTFP. Those with an income of more than Rs. 1 lakh p.a. depended on NTFP for only 2% of their total income. As income levels go down, the dependence on NTFP rises showing a 25% and 31% contribution of NTFP income to the total income of families within the Rs. 10,000-25,000 and below Rs. 10,000 income range respectively.

The same is true of the standard of living. The poorest sections rely on NTFP income for 24% of their total income whereas NTFP contributes only 10% of the income of the middle classes.

Table No – 5.3c
Contribution of NTFP income in Bandala cluster

Income	No.of Families
0-10000	4
10000-25000	33
25000-50000	20
50000-100000	5
100000 and above	3
	65

Total income v/s NTFP income	
Total income	% NTFP income
Below 10000	31%
10000 to 25000	25%
25000 to 50000	14%
50000 to 100000	7%
Above one lakh	2%

Caste	% of NTFP income
Havyaks	3%
Kare vokkals	15%
Marathis	22%
SC/ST	37%
Others	22%

Agricultural income v/s NTFP income	
Agriculture income	% of NTFP income
No land	48%
Below 10000	27%
10000 to 25000	19%
25000 to 50000	10%
50000 to one lakh	5%
Above one lakh	1%

3.0 History of NTFP collection

During 1950's, NTFP was not collected for commercial purpose. Some of the NTFP like Honey, *Mats* of *Ichalu*, Cane baskets were bartered. Collection of these NTFP was restricted to certain community like *Kharevokkaliga*.

Commercialization of NTFPs started in 1970. First commercialized NTFP was *Harda*, Honey and *Rampatre*. Price of Harda was Rs. 2 per dabba (tin) a tin approximately weighs 10 kgs), Honey was exchanged with a kg of groundnut oil. *Rampatre* was sold at Rs. 12 per kg.

Collection of *Uppage* started in 1980's. Earlier only women of *Kharevokkaliga* and *Havyak Brahmins* collected the *Uppage* (only seeds).

Change in listing and commercialisation.

About fifteen years back except *Dalchinni* and *Rampatre* all other NTFP, which are collected for commercial purposes were used for household consumption. *Uppage* seeds

were collected for extracting oil. However, nowadays, *Uppage* is collected mainly for its commercial value. Hardly few mature seeds were left on the tree for consumptive uses.

4.0 *PRESENT STATUS OF NTFP*

Description of present situation:

Cane: Earlier, about fifteen years back, all the Kharevokkaligasvokkaliga families were weaving the handicrafts from the cane. This was one of the main sources of income for them. Forest Department (KFD) out restriction on the people to collect cane from the forest. However, on the other hand, KFD, auctioned the Cane to contractors for collection. The contractor collected all the cane, whether it is younger, immature. As villagers recall, more than 150 truckloads of Cane were extracted from the region. This lead to destruction of the resource, and hence the non-availability of cane to the forest dependent communities.

As villagers were collecting only about half a truckload, that too only mature cane the collection was done sustainably. Now, because of non-availability of cane, farmers have to rely upon the plastic and rubber for agriculture purposes.

Some of the people, who survive by preparing cane articles are forced have to search for other sources of income. It is ironical that, the government is blaming these forest dependent communities for destruction of the resource.

Ichalu: Villagers are using the mat prepared from *Ichalu* leaves for various purposes. These mats were prepared by usually *Kharevokkaligas* community. At present they hardly get *Ichalu* leaves due to over harvesting by outsiders. Groups of 20 30 people from different region of the district, come here and they camp for about a week in the forest. They collect all the leaves. Unlike villagers, the outsiders collect immature leaves, young plants and also. All leaves of a plant. This has lead to decrease in availability of the leaves for villagers.

Dependence on consumptional NTFPs

Havyak Brahmins are mainly dependent on the NTFP for agriculture purposes and edible uses. They make *Thabli, Gojju, Chutney, Palya (curry), Kashaya*, soup, *Hashi*, etc. from edible plants. They are using 120 NTFPs for household needs. In which 68 are medicinal, 34 edible and 18-non edible. *Khare Vokkaligas* collect more commercial NTFPs, and

hunt wild fruits and wild animals. They extract oil from the seeds of *Garcinia morella*, locally know as *Arishina andi*. The oil is used for frying.

There are five traditional medicine men, belong to various communities in the village who give herbal medicines for both human beings and cattle. Many villagers also know herbal medicines for certain common ailments.

Natural fibres, which are essential for agriculture, have been replaced by the easily available polythene threads. The basic change in the technology, style of living, like electric fencing is responsible for decreased dependency on NTFPs.

5.0 MARKET VALUE OF NTFP COLLECTED IN BANDALA CLUSTER

Table No – 5.3d

Income from NTFP collected in Bandala cluster(1998-99)

Products	Price/unit	Quantity collected	Total value
Uppage (kg)	50	1500.00	75000.00
Rampatre(kg)	110.	1000.00	11000.00
Harda(kg)	6	2500.00	1500.00
Cane(nos)	25-30	2000	6000.00
Dhoop(kg)	85	100.00	8500.00
Seege(kg)	7	600.00	4200.00

Marketing channels: Contractor system exists in this cluster. Collector sells the product to the local dealer. The local dealer gives it to sub agent of the Contractor. Then finally the product reaches the industry through the contractor.

Village Fores committees (VFCs) have been given permission by KFD to collect NTFPs. In Badagi, the VFC collected *Uppage*. They paid less rates to the collector. As the collectors do not get market price for the product, they hesitate to market through VFC.

Market for new prodcuts of NTFP: In the past only the *Uppage* seed was collected for house hold consumption.After commercialisation only the rinds are being collected for sale.

Honey : Earlier , villagers used the honey, instead of jaggery. But now as the price of the honey has increased. They keep very little for household consumption and sell the remaining honey.

6.0 HARVESTING OF NTFPs

Pressures and destruction:

Marathis from the coastal region come frequently to the forest around the village to collect the highly commercialised NTFP like *Uppage, Rampatre* and Honey. They follow destructive harvesting methods.

Muslims from neighbouring villages also collect NTFP from this region in destructive manner.

7.0 LEGAL/TENURIAL ISSUES

Legal status:

The village is surround by Reserved Forest. All *Havyak* families, having areca garden has the *betta land*. Other communities even though they have areca garden they do not have the *betta land* because these areca gardens are planted recently.

The owner of the *betta land* is allowed to collect the NTFP and to sell it wherever he wants. But to sell the product lots of procedures have to be followed, to get the permission from the Forest Department.

In community owned *betta land* and encroached *betta land* the villagers themselves have demarcated the boundary of their *betta land*. Only the owner is collecting the NTFPs in this area. Unlike in open access forest, in these areas NTFP is harvested in more sustainable manner because of tenurial security. This has no legal sanction from the government.

8.0 GENDER AND NTFP COLLECTION

Table No – 5.3e

Gender and NTFP collection in Bandala cluster
(Average no of hours spent in collection in a year)

Particulars	Men	Women	Children
Commercial	443.56	415.45	211.12
Edible	16.52	216.12	114.52
Non edible	176.54	75.86	18.34
Medicinal	6.15	8.24	1

Figure 5.7 Proportion of income from different sources among different communities in Bandala Cluster

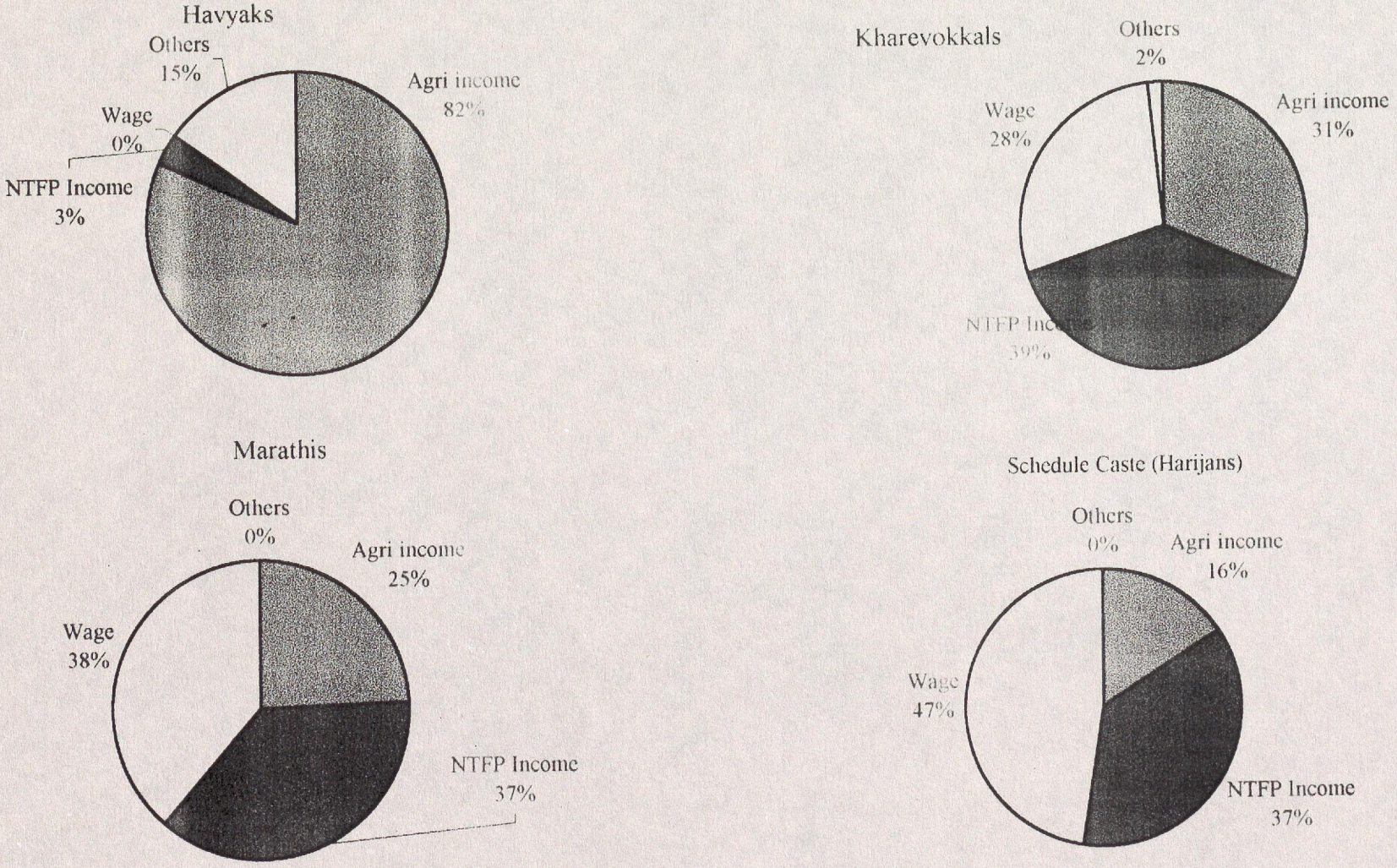
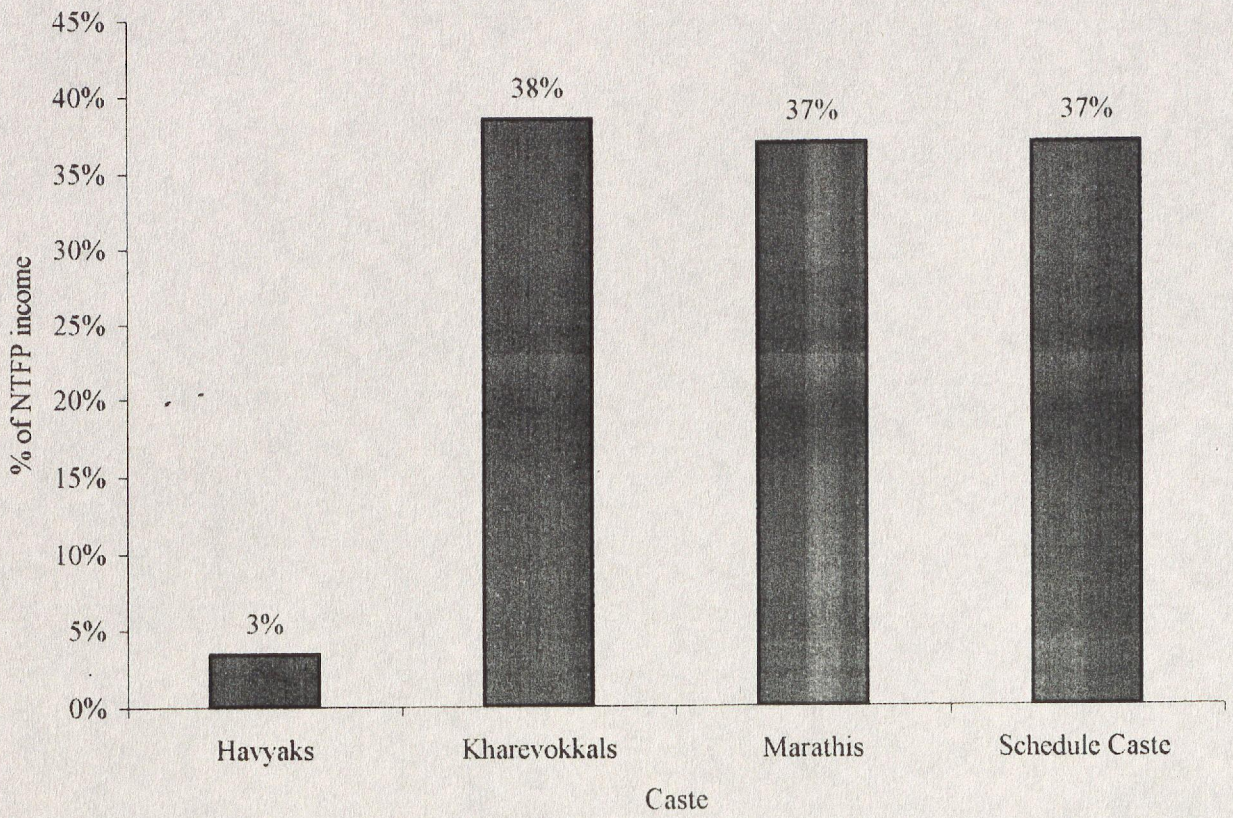


Figure 5.8 Contribution of NTFP income to the total income in Bandala Cluster



Men spend more time (443.6 hours in a year) in collecting the commercial NTFP. However, in case of edible NTFP women spend more time than men. To collect non-edible NTFP, men spend more hours. Nearly equal number of hours is spent both by men and women in collecting the medicinal NTFP.

Table No – 5.3 f

Decision making in marketing.

Men	Women	Both	Children
53.12%	11%	30.00	5.88%

Money from NTFP is used for

Particulars	%of responses
Family expenditures	53.14%
Personal use	12.53%
Not known	34.33

Although women spend more time in collection and processing of NTFP they are not consulted in decision making process.

4.0 HEGGADA DEVANA KOTE CLUSTER (H.D. KOTE)

1. Description of village and region:

H. D. Kote is the taluk headquarter, situated about 50 kilometers from Mysore. Two villages of this taluk were selected for study, which are situated about 86 kilometers from Mysore and 36 kilometers from H.D.Kote. This study cluster is selected as it is in the extreme southern part of Western Ghats. This cluster is situated between the two famous National Parks, viz., Bandipur National Park and Rajiv Gandhi National Park.

The villages are Hosahalli and Gandattooru. Both these villages comprise of mainly tribal communities. These villages are about 2 kilometers apart. The village is surrounded by Kabini backwaters. On the other side of the river is the Rajiv Gandhi National Park. The village Gandathoor is surrounded by the Gunde Reserve Forest and Hosahalli is adjacent to the Bandipur National Park. The tribals are locally known as *Jenukurubas* (honey hunters) and *Betta Kurubas* live in this area and depend entirely on forest products for their livelihood. The establishment of National Parks has resulted in eviction of tribals from the forests. In H. D. Kote taluk, tribals have been evicted twice because of the construction of the Kabini reservoir and establishment of Bandipur National Park.

A number of NGOs and other organisations have been working in this area for the upliftment of the tribals. As shifting cultivation and hunting are banned, tribals were pushed to search alternative ways of livelihood. The access to forest resources is denied whereas the dependency on NTFP has increased. Traditional values are collapsing, new social values are constantly at work and have their impact on their traditions. Thus all the traditional skills and knowledge about the tropical forest are disappearing.

Table No – 5.4a

Landuse in H.D.Kote cluster

Area in Ha	Hosahalli	Gandattooru
Geographical area	2895.64	1875.63
Forest area	1428.64	1285.00
Agricultural area	1467.00	590.63

Socio-economic status

Description of communities: The major communities living in the village are *Jenu Kurubas* and *Betta Kurubas*. Both these communities are classified as Schedule Tribes. *Jenukurubas* are live in more primitive condition than the *Betta kurubas*. Others residing in the village include *Malayalis* and *Eravars*.

As the name of the one of the tribal group, *Jenukuruba*, itself suggests, these tribes are dependent on collection of honey and other wild food from the forest. *Betta Kurubas* are living in slightly better condition than the former. Now they grow paddy, millet, and cotton.

Eravars are also the tribals who have migrated from Wynad region of neighboring state, Kerala. There is one family of Kerala origin running the ration shop.

Table No –5.4b

Population and Literacy in H.D.Kote cluster

Particulars	Hosahalli	Gandattoor
Population	268	364
Male	142	180
Female	126	184

Literacy

Particulars	Hosahalli	Gandattoor
Male	18%	16%
Female	12%	11.25%
Total	15%	13.6%
Above S.S.L.C.	4%	3%

There is one primary school in the village run by a NGO. Hospital is also run by the same NGO.

Weaker sections:

Jenu Kurubas, Betta Kurubas and *Eravars* are the Schedule tribes living in the village. These tribals lived in the forests. A Dam was constructed across the Kabini River in seventies. The tribal area got submerged under the water. They were engaged in shifting cultivation and in collection of forest products. After the construction of dam, they were rehabilitated and given the land for cultivation. Each family was given about four acres

of land. Due to illiteracy, and poverty most of the families live in primitive condition. However, now, some NGOs, and the Government is helping them.

Dependency on forests:

Villagers were dependent on forest products. Even now they list fourteen types of tubers they were using in earlier days as food. They cultivated only millet, by shifting cultivation.

Now they collect honey, tubers as vegetables, and agricultural implements. In recent years, their dependency on forests has decreased considerably. They weave articles from bamboo and cane for household use.

Only honey is the major commercially important NTFP. After formation of National Park, villagers are prohibited from entering into the forest to collect the NTFP. Hence the dependency's decreasing in recent years.

Table No - 5.4c

Dependency on NTFP in H.D.Kote cluster

Caste	Agriculture	Wage	NTFP	Others	Total	% NTFP
Jenukurubas	2628.5	1680	1145.26	62	5515.76	21%
Bettakurubas	2945.36	2150	465.35	150	5710.71	8%
Eravars	3015.25	2260	680	550	6505.25	10%
Others	0	0	0	62000	62000	0%

Jenukurubas get about 21 % of their income from collection marketing of commercial NTFPs, mainly honey. Other NTFPs recorded as collected from region are *Magali beru, Seegei, and Amla or Nelli.*

Occupation: Presently agriculture is the major income source for villagers. *Ragi* (millet) is grown by villagers. This is the staple food. They have started growing cotton. The government and NGOs have motivated them to grow cotton. They use chemical fertilizers and pesticides to grow cotton.

2.0 *FOREST ECONOMY*

Relation with village/regional settings: The village is situated on the bank of Kabini River and bordered by the dry deciduous forests. Inside the National Park NTFPs are available in plenty. However, in the forests near the villages is degraded and very few

NTFP species available. Hence there are very few NTFP species available near the village.

Role of forests in agriculture: Shifting cultivation was practiced by the villagers. Now they are forcibly settled and cultivate millet. The forests provide manure, fencing, fibers, fodder, and fuel wood. They use as plant based pesticides *Mukkadaka, Kare kai.*

Dependency of weaker sections on forest for NTFP: The dependency on the forest products is decreasing among the tribes. Restrictions are imposed by the Forest Department, by denying the access to collect NTFPs from National Parks. General conditions of the village

The forest cover has decreased due to various factors. Submergence, rehabilitation, and conversion of natural forest into monoclture plantations are responsible for destruction of forests.

***3. History of NTFP collection*:**

Collection of NTFPs was integral part of their life. After the construction of the Kabini Dam, they were evicted from the forest. The Forest Department has raised monoculture plantation of exotic *Acacia* species. Raising of these monoculture plantations has reduced the avalability of the NTFPs.

Table No: 5.4d

Chart showing NTFPs available over decades in H.D.Kote cluster

	1990	1970	1960
Forest cover	Monoculture plantations	Grass land with scrub forest	Thick forest
Available NTFPs	Edible- Nil Non edible-Nil Commercial –Nil Medicinal-2 Fuelwood and Fodder shortage	Edible-5 Non-edible-10 Commercial –6 Medicinal-15 Fodder Fuelwood	Edible-25 including 14 tubers Non-edible- 15 Commercial –6 Medicinal-45 Fuelwood Fodder
NTFP collection	Villagers cannot collect NTFP from the neighbouring National Parks	Even though collections of forest products were not allowed legally, they collected in small quantities.	Villagers were living inside the forest and survived on the forest resources.

4.0 *PRESENT STATUS OF NTFP*

Detailed description of present situation: At present villagers have settled on the fringes of the forest. They are not allowed to collect NTFP from the forest. However, villagers manage to collect honey from the forest.

Dependence on consumption NTFPs: They were collecting about 14 types of tubers as food. These tubers are *noore, gunni, akki, nerige, eka, sala, vala, kirana*, etc. they also hunt wild animals like.

5.0 MARKET VALUE OF NTFP COLLECTED

Table No - 5.4e

Income from of NTFP in H.D.Kote cluster (in the year 1997-98)

Name of NTFP	Quantity harvested	Approximate income
Honey	15 quintals	67500.00
Magali beru	3 quintals	2700.00
Bamboo	5000 nos	35000.00
Nelli (Amla)	10 Quintals	3000.00

Marketing channels:

LAMPS: NTFPs are marketed through the LAMPS of H.D.Kote. They have the right to collect NTFPs from the region. Every year they decide the price for each product. Occasionaly they gave advance to the tribals to collect NTFPs.

Tribals go into the forest on a honey hunting expedition and return to their village only after marketing the honey. They sell the honey at the rate of Rs 45/per Kg in adjoining Kerala State, where the price is slightly higher.

7.0 LEGAL/TENURIAL ISSUES

Legal status: The village is surrounded by Bandipur Tiger Reserve (Natonal Park), Nagarhole National Parks and Gunde Reserve Forests.

Problem of ownership rights: Often there are conflicts between villagers and forest officials regarding collection of NTFPs in the forest, specifically in the National Park.

Figure 5.10 Proportion of income from different sources among different communities H.D.Kote Cluster

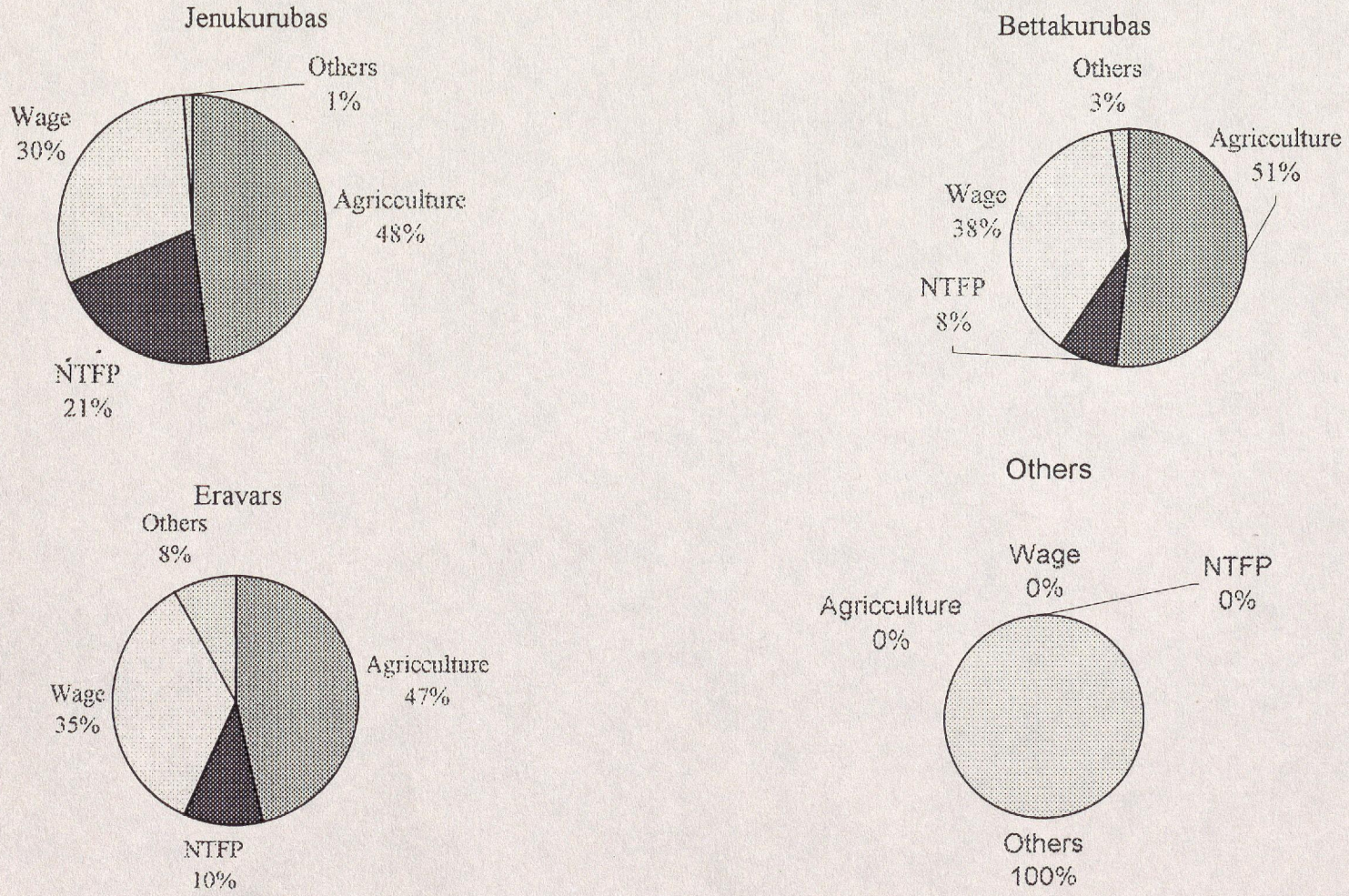
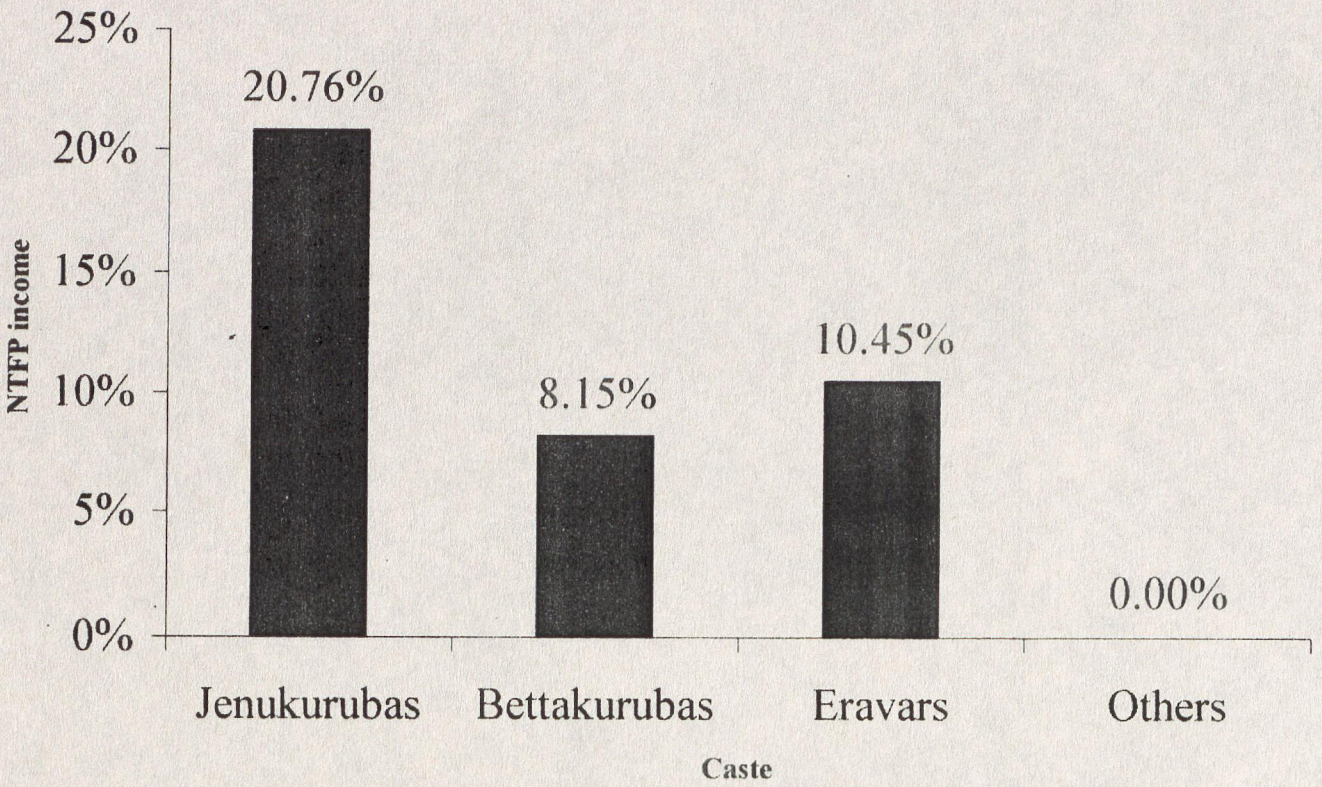


Figure 5.11 Contribution of NTFP income to total income at H.D.Kote cluster



Legally, they are not allowed to collect NTFP from National Parks. However, the villagers continue to collect the NTFP.

Tenureal systems in operation: Traditionally when, a honey hunter finds honeycomb in a tree, he worshipped (*Pooja*) and marked the tree. Once a person marks the tree other people do not harvest this comb. He who has marked a tree can harvest the honey. Usually he harvets the honey after it is mature. In this system maximum quantity of honey is available with good quality. The days before the arrival of the monsoon are the best time for harvesting honey. Honey was harvested in a sustainable way.

But as things have changed, such religious and social customs are disappearing at a faster pace. Now, they rarely follow this custom.

8.0 GENDER AND NTFP COLLECTION

Men and Women from *Jenukurubas* and *Betta kurubas* spend almost equal time in collection of NTFPs. Collection of honey is done mainly by men.

Women have no decision making power in the family.

HONEY HARVESTING

The area is covered by dry deciduous type of forests, with a variety of forest species. Honey is available in large quantities. Honey bee species in Western Ghats of Karnataka, are *Apis dorsata*, *Apis cerana*, *Apis florea* and *Trigona iridipennis*. Honey from *Apis dorsata* and *Apis cerana* are harvested in much higher quantity and are mainly collected by tribal.

There are fairly good numbers of *host trees* in the forests. The host trees of *Apis dorsata* are known as '*Bare*' or '*Pademara*'. The major host trees are *Tare* (*Terminalia bellirica*) and *Kadaba*. These trees are spread over range of 5 to 15 kms. The tribal people know each and every B*are* (host tree) and identify each tree by its individual name.

In this region, honey is harvested two times in a year, in the month of November and December and again in May. They collect honey in both of these seasons. Usually, about 8 to 10 members form a group to go on honey hunting. In earlier days, each group was supposed to collect honey from some specific trees. But now such traditional rules and binding are breaking down.

The group starts searching honey hives in the forest. The tools they carry are simple: a knife, rope and cane. Other necessary tools like thread, *eni* etc., are made in the forest.

After identifying a tree, harvesting of honey is planned and accordingly tools are made. *Eni* (ladder) is prepared using bamboo. In some cases surrounding trees are used to climb the tree. In most of the cases about two to three ladders are tied to reach the branches of the host tree. If there are more than 10 colonies on a tree, more than one person, and sometimes, if necessary, four to five members climb the tree.

Usually leaves of *Udi soppu*, a shrub available in the forests, are used smoke the bees. If this particular species is not available in that area, then green leaves of any other species are used for smoke. The branches with green leaves are tied with some combustible dry grass and burnt to get the smoke.

Honey collection is carried on during night. One of the experienced person among the group climbs the tree and ties the rope to a branch and puts down the other end to the ground. A bundle of dry grass, covered by either *Udi soppu* or other green leaves, is sent above with the help of a rope to the person handling the colony. If there are more than 10 beehives, as mentioned earlier, more than one person climbs the tree. In such cases the work is divided among them. One person smoothly brushes the bees off the comb, with a broom of leaves, while the another collects the honey. Pieces of honeycomb are sent to the ground in baskets specially prepared of bamboo.

As the tribals say, *Apis dorsata* makes honey in central part of the comb. For harvesting honey in sustainable manner, they collect honey only from the central part of the hive,. The brood is left undisturbed. In the process causing minimum damage to the bees.

As these people do not carry materials for cooking food, they live on the forest produce during the collection. They eat bee brood, along with other tubers and honey. Usually, the honey harvesting continues for a week or two depending on the number of bee colonies.

5.0 HOSANAGAR CLUSTER

1. Description of the village and region.

The study villages Manjagalale and Nagodi in Hosanagar Taluka of Shimoga District are about 25 kms from the taluka head quarters Hosanagar. The residents are from the villages submerged under Linganamakki Dam across Sharavati River. The forest is degraded as well as encroachmend.

Both the villages have large geographical area. About 50% of land in Manjagalale and 10% in Nagodi is submerged under backwaters of the Dam. The village is located in the ridge between backwater and the crestline of Western Ghats. Hence, the transportation and other facilities are limited.

Table No – 5.5a

Land use in Hosanagar cluster

Particulars	Manjagalale	Nagodi
Total area(acres)	1500	1200
Forest area		
Arable land	680	623.5
Others	395	339.5
	425	237

Socio-economic status

Havyak Brahmins, Uppar, Harijan (SC), *Divru Naik, Shetty, Poojar, Namdhari, Gouda, Moger, Vishwakarma* and Goldsmith communities live in the village. Agriculture is the main occupation of the people. Arecanut, Coconut, Black Pepper, Cardamom, Paddy, Banana are the major crops grown in the area. Other major sources of livelihood are trade, forestry activities, and daily wage labour. Due to hills and high rate of soil erosion, the productivity of the land is low.

Edigas worked as bonded labour. Now they posses mariginal land after the implementation of land reforms. The land holding is small and it is not enough to sustain them, most of the families in this community earn an income through daily wage and NTFP collection. Traditionally, the Vishvakarmas or *acharis* are carpenters.. However, they are now engaged in other occupations to sutain themselves.

Mogers are also communities who migrated from the coastal region of Kundapur taluk South Kanara District. Although some of them possess small patch of agricultural land, they continue to work as agriculture labourers. They depend on the collection and sale of NTFP to supplement their income.

Havyak Brahmins are the major landowners who have converted paddy fields to areca plantations. Their dependence on NTFP is mainly for domestic consumption purpose.

The trading class is represented by *Gowda Saraswath Brahmins (GSBs)* and *Shetties*.

Gowdas comprise of the Kharevokkaligas, who are mainly forest dwelling communities. Their main source of income is through sale of cane handicrafts and agricultural labour. They also posses small patches of agricultural land. They are heavily dependent on NTFP.

In this region more than 95% of the NTFP collected is mainly consumed at the household level. Some products also sold to earn additional income. A total of 95 NTFPs were listed during the PRA exercise conducted in the village. Majority of these are used for household consumption. The sprouts and leaves of several plants/trees/climbers compliment the diet of the forest dwelling community. More than 25 such NTFP species have been identified. Leaves are used in preparing dishes (*rasam, tambli, gojju, palya* and others). The use of these products are found more amongst the *Havyak* than other communities. Most of these produce possess medicinal properties.

Hasalaru: Are Schedule Caste residing in this region. Most of them have small patches of paddy land. They work as agricultural labourers and NTFP collectors. They are the lowest in the caste hierarchy.

Table No: 5.5b

Population and literacy in Hosnagar cluster

Particulars	Manjagalale	Nagodi
Population	865	912
Male	430	512
Female	435	400

Literacy

Particulars	Manjagalale	Nagodi
Total literacy %	55.99%	51.05%
Male	62.61%	58.2%
Female	49.38%	43.9%
Above 10^{th} std	14.6%	8.7%

Weaker sections:

Edigas and *Harijans* are considered as weaker sections in the society. They have very little or no agriculture land. NTFP collection and agriculture labour are their occupation.

Dependency on forests:

It is found that dependency on consumption NTFP is more compared to other clusters. About 40 plants are used for making dishes. (An additive prepared by leaves to use with rice). Another 20 species are of tubers, leaves, mushrooms, flowers, etc are used in food preparation.

Green leaves of more than 15 species are used in making manure. Dry leaves are collected from the forest for making manure and mulching the arecanut garden. Fuelwood, fodder bio-pesticide, fiber, agriculture equipment are also collected from forests.

Agriculture: Large number of fibres were prepared from different herbs, trees, climbers in the past. *Baine, Appachi beelu, Ganape beelu, Kari beelu, Canes, Basari, Kavalu, Sheek balli* are the important fibre species. Previously, the fibre extracted from these plants were used to bind thatching material for houses as well as for fence. However, due to the shift in roofing material from thatch to tiles, the use has decreased. This has reduced dependence on the number of fibres collected from the forest. Plastic threads have replaced the use of plant based fibre.

Cane is used for various agricultural purposes, *Baine (Caryota urens)* is used in fencing, *Appachi beelu* is used to tie the pepper climbers to the areca tree.

Baine: Like coconut *baine* is considered as the '*Kalpavruksha*'. Every part of the *baine* tree has multiple use. The leaves are used as thatch, and in the construction of *machans* in the fields. The inflorescence soaked in water for a few days is used as an excellent fibre in fencing. The split trunks are used for irrigation purposes, for fencing, and in agricultural equipments. The inner part of the stem is used as a source of starch which was consumed by the poorer sections of the society.

Dependency of weaker sections on forest for NTFP:

Edigas are making cane articles. They are collecting more than 8 commercial NTFP from the forest.

General conditions of the village

State of the forest: Construction of the hydel Dam across Sharavathi river has changed the entire picture of the region. Most of the people migrated to this village are from the submerged areas. This resulted in the decrease in forest area due to the increased pressure on the forest. In addition to this the logging by KFD has also destroyed natural forests.

Commercialisation of NTFP:

Honey :- *Apis dorsata, Apis cerana, Trigona, and Apis florea* are different species of honey bees found in the area. Quantity harvested from Trigona and Apis florea is negligible. Honey from Apis cerana is consumed in the household mainly for medicinal purpose. The major source of honey is obtained from Apis dorsata followed by Apis cerana. Honey from Trigona and Apis florea, both of which are obtained in very small quantities, is mainly used as medicine.Sheege [*Acacia concinna*] A small quantity of Sheege is also used for household consumption, as an alternative to soap.

Cane was abundant in the past; but continuous use for agriculture purpose, has led to the destruction of the resource.

The case of alienation and destruction of the forests aided by the Forest Dept.

The tribals are dependent on the forests for harvesting cane. They extracted a limited quantity for weaving cane articles. The (Karnataka Forest Department) has auctioned the Cane to contractors for commercial purposes. The KFD assured that part of the cane collected would be given for local consumption. However, the reality is different. Cane is not supplied to villagers. The tribals have seen the Cane resource being destroyed by Contractors. While harvesting cane, the tribals follow certain norms that help in preventing over extraction. However, the labourers employed by the contractors have no interest in conserving the resource. They damage the stock that leads destruction of the resources. Now local people do not have the resources that support their livelihood. The alienation from the resource base is complete.

Only some families collect cane from the inaccessible forest regions. They make baskets of various sizes to be sold outside the village.

Murugalu (Garcinia indica) :Traditionaly this is product was consumed at home. Now the rind of the fruit has a commercial market.

Ichalu (*Sylvestris phoenix*): Leaves are used to prepare mats. Women from poor families of the *Shetty, Uppar, Gowda, Harijan, Divru, Poojar* and *Moger* community weave the mats. The sap from the tree was used for the preparation of alcohol. The kernel, which resembles the date fruit, is still popular with the children as a wild fruit.

3.History of NTFP collection:

Situation around 1935: The population of the village was comparatively less, with minimum pressure on the forest.

Villagers started collecting NTFP for commercial purpose since last two decades. The collection of NTFP was for consumption purposes.

The demand for some NTFP like *Antwal, Rampatre, Honey, Seege*, and cane products has increased. The KFD started auctioning some of the NTFPs like *Gulamavu*, *Dalchinni* leaves, *Dhoopa*, Honey etc. The contractor came with his labourers to harvest the NTFP.

Listing of NTFP:

During the PRA the people listed 115 NTFPs out of which 94 NTFP are used reguraly by the villagers. Majority of the products are used for household consumption. The sprouts & leaves of several plants/trees/climbers are part of the diet of the forest dwelling community. More than 75 NTFP species have been identified which are used as food.

NTFPs for domestic consumption:

Wild vegetables like *Kacharagadde, Arargadde, Haadegadde, Kaadu Arishina gadde, Shatavari* are the tubers collected from forests area and consumed mainly as sources of starch. Apart from the use of tuber, the *Kacharagadde* and *Arargadde* are sliced, dried & powdered and stored for 6 months to one year. *Shatavari* is used as in food and in preparation of medicine. The tubers are used to increase the milk production both in human beings and cattles. *Kachargadde* powder is also sold. Flour of the *Kadina Arishina Gadde* is used to make *'Halva'* (sweet).

Mango : Mango is collected by the villagers. Generally the mangoes are collected for household consumption. There is no market for the mangoes near the village, due to which a large quantity is wasted.

Bamboo: Bamboo is collected mainly for agricultural purpose.Bamboo products, indegenously made, have various uses in the day to day activities of the forest dependent

communities. Bamboo poles are used in construction of the house. Bamboo shoots are also consumed as vegetables.

Halasu (*Artocarpus heterophyllus)*: The fruit, nut and seeds are used for household consumption in preparing several food items and papad.

Nelli (*Emblica officinalis)*: It is used as a medicine and pickles. But in recent years some villagers have started to collect it for sale. It is sold to Ayurvedic Doctors and Ayurvedic Pharmaceutical Companies, Nelli leaves are also used as Plant based pesticides.

Arishina Gurige (*Garcinia morella)*: The oil extracted from the seeds is used for cooking and illuminating purposes, however, this practise is stopped.

Mushrooms: Most of the community collect mushrooms for household consumption. They are found in monsoon, during the month of August, September and sometimes in October.

Wild pepper: It has been reported that around 15-20 years back more than 100 Kgs. of wild pepper could be harvested from the forests near the village in a year. However, now the wild pepper has become rare. This is mainly due to the unscientific methods of extraction involving pulling down the climbers down, or lopping and cutting the branches and trees on which the climbers grew. Another possible reason quoted is the clear felling of the forests for *raagi* (finger millet) crop by the *Kunbi* community (shifting cultivation).

Gavatekayi and *Maadhagala kayi*: The fruit produced by this climber species is edible NTFP. The unripe fruits are used in the preparation of several dishes and curries. Earlier, these climbers could be found in the private lands of the villagers, degraded forests and in natural forests. Normal yield per climber would be 1-2 Kgs. It was also used as a fodder species. The roots are also consumed and is believed to have medicinal properties. However, due to unsustainabler means of harvesting which includes pulling down of the entire climber and digging up entire rhizomes, these plants have become rare. The fate of *Maad hagal kayi* is also the same. In recent years, there have been efforts to cultivate these plants.

Change in listing and commercialisation:

The following products have become commercial NTFP in recent years.

Cane: The cane products were used by villagers. However, now the products are being sold in urban centers like Sagar and Shimoga.

Uppage: This is collected, as there is increased demand and high price.

Murugalu: A industry started for extraction of juice from the rind. This has led to increased demand for this rind from last four five years. Earlier the rind was used as tamarind substitute by villagers. Oil is extracted from seeds of the fruits.

Vatehuli: Earlier villagers were using this as tamarind substitute. However, the product sold in small quantity to neighboring villagers. This is used as medicine.

Kacharagadde, Araragadde: These two are the rhizomes available in the region. This contains starch. The starch is extracted by the villagers. It is used as medicine. Recently the product is sold in the market for about Rs. 150 per kg.

Medicinal plants: The demand from the Ayurvedic industries in the towns has resulted in increased demand for medicinal plants. However, collection of medicinal plants is being done by only few persons, who have the contacts with factories.

Appachchi balli: A climber available in the region and is used for tying the cultivated peppers, in the areca gardens.

4.0 *PRESENT STATUS OF NTFP*

Dependency on NTFP is changing from consumption use to commercial. Improvement in communication facilities in the village paved the way to change the life style. The older generation had knowledge of medicinal plants and other traditional practices. They have passed away, without transferring the knowledge to present generation. The younger generation is not interested in plant resources. Villagers are attracted towards the easy and quick responding allopathic medicines and facilities available in the nearby urban regions.

Dependency on consumption NTFP is decreasing because of following reasons.

- Non availability of certain NTFP species: NTFP species like Balagundi plant that was used to treat blast diseases has become extinct because of degradation of forest and overexploitation.
- Lack of knowledge about the use of traditional medicine. Most of the younger generation is unaware of the uses and identification of these plants.
- Popularization of green revolution has resulted in extensive use of easily available pesticide, chemical fertilizers and insecticides replacing the bio pesticides.

- Prejudice imposed by the modern society for using the traditional NTFPs. The faith on traditional medicines and medicinal men has eroded. People find it difficult to prepare and use the herbal medicine and follow the diet associated with traditional medicine.
- Villagers are aware of some of the elderly person in this region who knows medicinal uses of more than two hundred species. But today number of traditional medicinal men, number persons using traditional medicines and availability of medicinal plants has decreased.

As agricultural land and number of farmers have increased, the use on NTFP in agricultural purpose has increased. However, the availability of this product has decreased because of continuous use of these products like cane bamboo, baine etc. So the villagers are unable to collect the required NTFP from the forest.

Farmers were using more than 20 different climbers and plants as fibers. Now there are only 5 species found in the forest. Plastic ropes and threads have replaced the natural fibers and some of the climbers have become extinct in the wild, for e.g., Karibeelu.

Pressures and conflicts:

After construction of the Dam, people from neighbouring states migrated to grow paddy in the backwater in summer. Some of them have encroached forest. They have also started collection of the NTFP, having commercial and medicinal uses. This has lead to entry of more collectors in the existing forest area resulting in the over exploitation of these products.

Dependence on consumptional NTFPs:

Dependency on NTFP used as vegetable is decreasing. Vegetables grown elsewhere are readily available in the village. In addition, the present generation does not like the dishes prepared by wild plants. Inferiority in using the forest product as vegetable is another reason for neglect of NTFPs. Even if they want to use these products, they cannot identify the products. The knowledge of wild plants is diappearing.

However, the villagers are using more number of consumption NTFPs compared to other villages. *Brahmins* use more than 130 NTFPs, in which 75 are edible NTFP, 15 are Non-edible, 40 are NTFP used for medicinal purpose.

5.0 Market Value of NTFP Collected

Table No: 5.5c

Income from commercial NTFP in Hosanagar cluster (1998-99)

Product	Quantity (kgs)	Income in rupees
Seege	500	4000
Murugalu	150	4350
Uppage	500	32500
Honey	100	6000
Harda	10000	30000
Rampatre	80	8700

Local traders purchase these products. Contractor system of marketing exists in this region.

6.0 Harvesting of NTFPs

Pressures and destruction: The area had dense forests, but due to various factors like resettlement, encroachment and commercial exploitation. The forests have been degraded.

Possibilities of sustainable harvesting: Villagers opined that tenurial insecurity plays mojor role in unsustainable harvesting of commercial NTFPs. NTFPs like *Rampatre*, *Uppage, Seege* are being harvested destructively, cutting of branches and sometimes the entire tree. In some cases it is done because of the competition and to collect maximum quantity in minimum time.

The villagers tell that the entry of outsiders in to the forest should be prohibited. The feeling that NTFP resources belong to the villagers would help in conservation of NTFPs.

7.0 Legal/Tenurial Issues

The region has several type of tenurial system. Mookambika Wild Life Sanctuary is located on the western side of the village. It is illegal to collect NTFP from Wild Life Sanctuaries. However, the villagers continue to collect the NTFP, though this is an illegal. Reserved Forest is also present near the village. Besides, the farmers, especially areca planters have a strip of land adjacent to their farms. The strip with width of 15 meters adjacent to the areca plantation is given to the farmers to fulfill the requirements for manure fodder etc. In this strip, only the owner of the land is collecting the NTFP.

8.0 Gender and NTFP Collection

Number of NTFP's collected for household consumption is found more in this cluster. Generally, women do the collection, processing and cooking of these NTFP. Men take the decision of marketing the commercial NTFP and using the income from NTFP.

Case study:

Name- Parvati Hegde(45)
Caste- *Havyak*
Village- Manjagadde
Taluka- Hosnagara, (District- Shimoga)

Description of the family: Ganapati Hegde has undergone kidney operation. Now he is not in a position to do any work on the farm and Parvati and other family members are working on the farm.

Occupation: Agriculture is the only occupation for the family. They have one and half acres of areca plantation, acre of paddy field is recently converted into areca plantation.Total income from agriculture is 1,52,000.00 in 1997-98. Expenditure like labour cost, manure, pesticide and irrigation and irrigation is about 68,000.00.

NTFP collection:

NTFP is collected only for household consumption. They use different variety of wild resources as vegetables in their daily diet. Parvati Hegde has an in-depth knowledge of these wild foods, in identifying the species and in cooking and processing them. She says that she got the knowledge from her Grand Mother who had knowledge of utilising wild plant resources. She feels that the younger generation has no interest in wild plant. They feel that these wild plants are inferior in comparison to the vegetables available in the market. The sprouts and tender leaves of more than 45 plants/trees/climbers are collected to be used as food. Wild roots and tubers like *Kachaargadde*, *Arargadde*, *Haadegadde*, *Kaadu Arishna gadde* and *Shatavari* are collected for domestic consumption. These products are used in making several food items like vegetable Sambaar Lentil curry Gojju savoury relish Tambli (appetizer) drink, sweet items. Collection of these products, processing and cooking is done by Parvati.

Considering the diversity and nutritional value of these vegetables, there is an immediate need to conserve the knowledge of wild plants. They have to be documented and sustainable harvesting methods need to be developed. Apart from this, NTFP meets the requirement of agriculture like manure, fodder, bio-pesticides etc. The family purchases some of the NTFP like honey, *Ichalu* mats and brooms, cane articles, bamboo mats and bamboo ladder.

Figure 5.13 Proportion of Income from different sources among different communities in Hosanagara Cluster

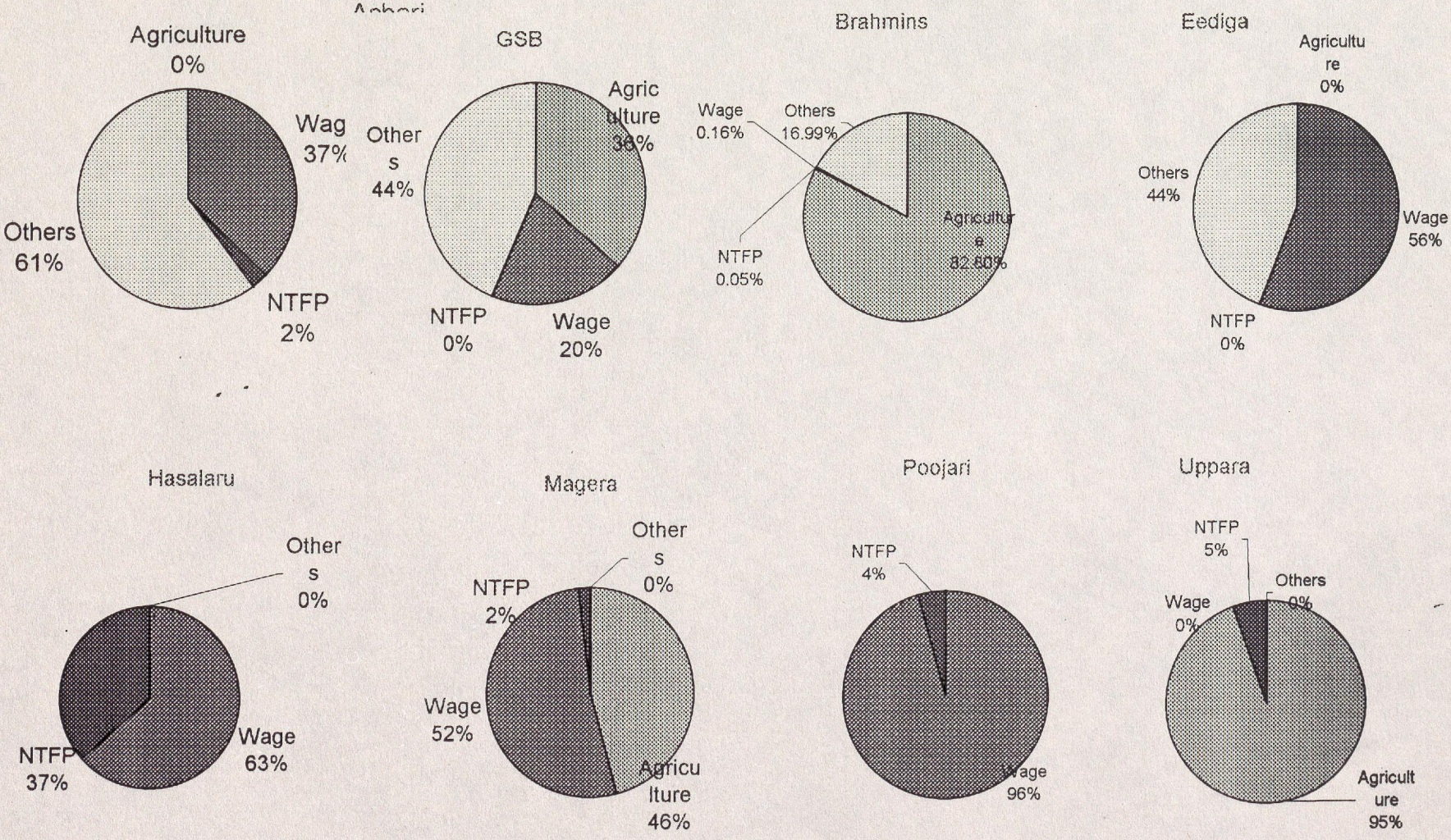
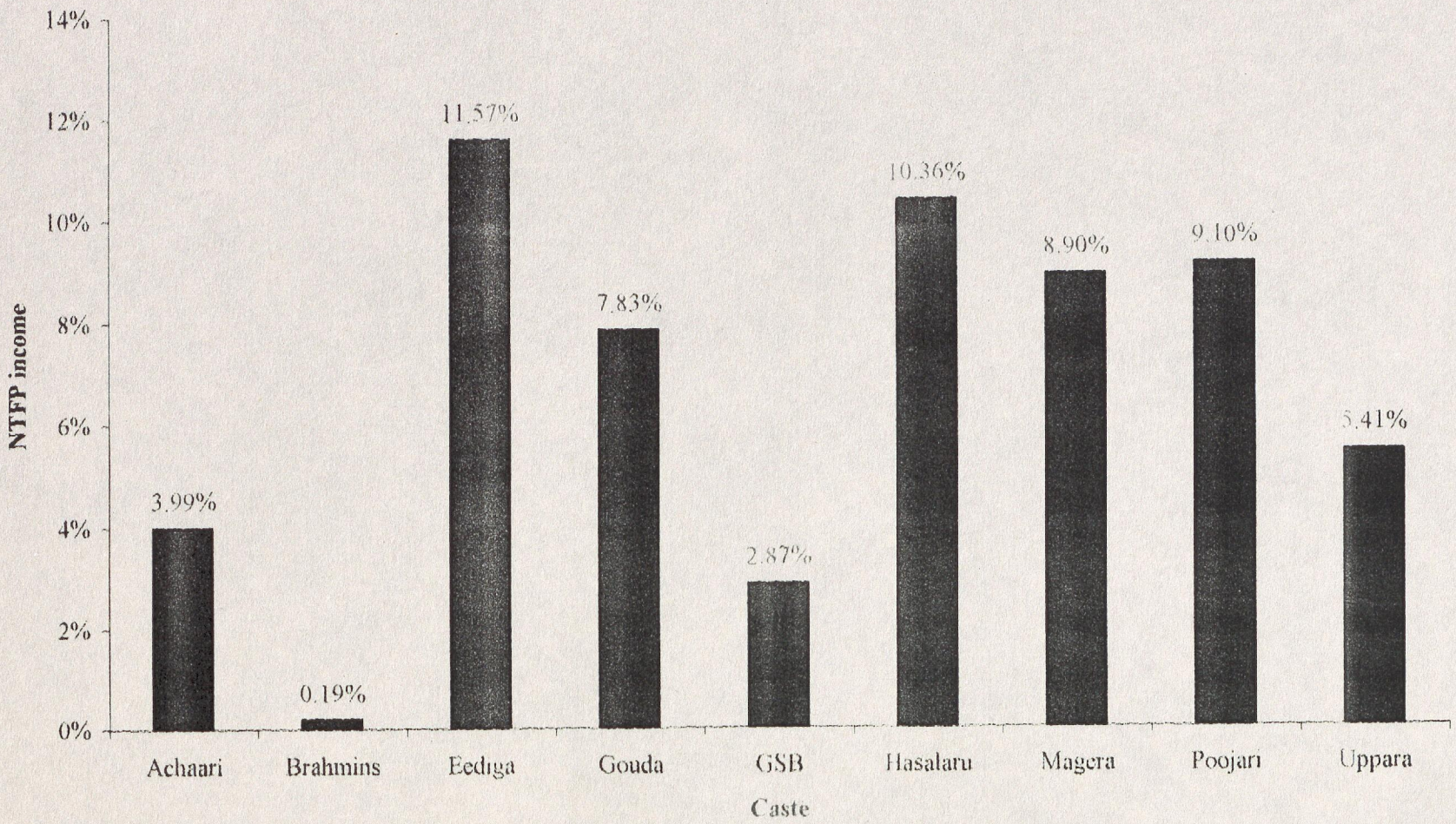


Figure 5.14 Contribution of NTFPs in total income in Hoasanagara cluster



6.0 KARKALA CLUSTER

1. Description of the Village and Region.

Durga Village is situated about 11kms from Karkala town. There is a Narrow forest belt near the village. Durga is the revenue village, which includes Durga, Tellar and Malebettu hamlets. Tellar and Durga hamlets are highly populated and there is no forest around these hamlets. Although there are tribal communities in Tellar and Durga hamlet, their dependence on forest is negligible. However, Malebettu is surrounded by natural forest. Tribal of this hamlet depend on forest for their daily requirements. Since the Durga village is vast and highly populated (more than 5000 people) and the forest dependency is high in Malebettu hamlet only the latter is selected taken for the study. The Hamlet is located on the foothill of the Western Ghats.

Table No: 5.6a

Land use in Karkala cluster

Particulars	Durga Village	Mala
Total geographical area	487370 acres	11614.6acres
Forest area	1618.40acres	8364.4 acres
Agriculture	2193.05acres	1840acres

Socio-economic status.

Marathi Brahmins- (*Chitpavans*) Migrated here from Maharastra, particularly from Ratnagiri districts about 400 years back. Agriculture is the main occupation, some of them are employed in cities.

Havyak Brahmins- Recently they purchased agriculture land in this village. Agriculture is the main occupation. They are experts in growing areca and spices.

Karaad Brahmins- Agriculture is the main occupation for them. Some people are also involved in trade and service.

Shetty- Bants. They have small plots of agriculture land NTFP collection and agriculture labour is the major occupation.

Poojari - They have small land obtained after Land Reforms Act. Agriculture labour NTFP Collection and trading is the major occupation.

Marati Naik- (Scheduled Tribe) Considered as weaker sections. NTFP Collection and labour is the major occupation.

Mera are engaged in NTFP Collection and labour.

Christians: Trade and Agriculture is their main occupation

Table No: 5.6b

Population and Literacy in Karkala cluster:

Particulars	Durga Village	Mala
Total Population	3214 (452 families)	5420
SC	325	NA
ST	438	NA

Literacy	Mala	Durga Village
Male	46.2 %	71.0%
Female	36.7 %	66.2%
Total	41.45%	68.6%
Above S.S.L.C	15 %	32.06%

There is only one lower primary school and an Anganawadi (Nursery School) in Mala , Secondary School is in Tellar. They have to go to Karkala for higher education.

Weaker sections:

Mera and *Marathi Naiks* are the weaker sections of the society. They are landless labourers and socially deprived.

Dependency on forests: It is found that weaker community of Mera and *Marathi Naiks* depend on commercial NTFP's like *Rampatre,* Canes, and Honey. *Moyli shetty* and *Poojar* community collect NTFP's, that fetch high price. *Brahmins* collect the NTFP only for domestic consumption and for medicine.

Occupation: Agriculture is the major occupation of the villagers. Arecanut, spices Black Pepper, Cardamom, Dalchinni, Cocoa and Coconut are the important commercial crops. They grow paddy, urd, banana, vegetables, and fruit trees for domestic consumption. In recent years same farmers are cultivating vanilla. All communities other than *Brahmins* go for wage earning in arecanut plantations. Many people are rolling the beedi (local cigarette). Certain families are engaged in trade and Service. In most of the families one or two persons are employed elsewhere.

The community wise income resources show that Christians and Brahmins are getting their important income through agriculture. Brahmins get 70.19% of the total income by agriculture (Rs 36790) and Christians 67.94% of total income is from farming. (Rs 21454).

Marathis, Shetty and *Poojaris* are getting their major income from trade, service and some other sources. Shetty community gets 63.27% of income from other sources.

2.0 Forest Economy

Relation with village/regional settings:

Out of the two villages selected for study, Mala is situated on the foothills of Western Ghats. However, unlike other clusters, both these villages have comparatively high population. Hence the pressure on the forest is also much higher in South Kanara. At least one person in a family is working outside the village, in cities, like Mangalore and Mumbai.

Mera community earns 20% from NTFP to their total income. The *Marathi Naiks* earn 9% from NTFP.

Role of forests in agriculture: Agriculture land is increasing every year. More and more land is converted into plantations especially in valleys and in the forest. Paddy fields are converted into acreca plantations. The acreca plantations need more quantity of manure fodder green leaf and dry leaf manure than that of the paddy fields. Articles prepared by canes are used in various agriculture operations. Bamboo is used in making mats, ladder and in making *Joti* (*Joti* a long stick with a hook at the and used mainly to harvest the arecanut and in spraying bordo mixture. Mats and *Gorabu* are made from *Vaate bidiru* (reed). Several other agriculture implements are made from *Jack, Baine, Shivane* trees *Kasarka, Lakki, Bacchala soppu* are used as bio-pesticides and pest repellants. Fibres are prepared from climbers and from *Basari Kavalu, Pundi.* Some climbers are used as fodder.

Dependency of weaker sections on forest for NTFP:

Mera and *Marathi Naik,* are the weaker sections of the society. They collect NTFPs and make articles from canes, *Vaate bidiru*, and *Mundaga.* The income earned from NTFP is

more than that of agriculture income. *Mera* community is earning nearly 20% of the total income through NTFP. *Marathi Naiks* are earning 9% of the total income from NTFP.

General conditions of the village

Encroachment in Malebettu region: As mentioned earlier, the village has a narrow strip of a forest. It is encroached by people belonging to various communities. They built houses and encroached forests for agriculture. The forest is totally degraded.

Increase in population, conversion of forest into areca plantations and the increase in demand for forest resources have put additional pressure on the forests.

Logging and selective felling has been carried on by KFD through contractors and forest-based industries. This has also caused degradation of forest.

Rubber plantation is established mostly by the KFD. Natural tropical forest is cut down to establish the rubber plantation. This has destroyed the diversity of forest ecosystem.

3.0 History of NTFP collection:

The collection of NTFP started about hundreds years back. Wild pepper was the first product collected for commercial purpose. Afterwards, people started to collect *Rampatre, Dalchinni buds*, Honey for commercial purpose. In the meanwhile, the government auctioned certain products to contractors. Contractors recruited their own agents to harvest *Vaatehuli, Jackfruits and Mango*. Articles prepared by Cane, Bamboo, Vaatebidiru is used for household consumption. These products are exchanged within the household in this region. Continued harvesting combined with unscientific methods resulted in decreased availability of several NTFPs. The product collected by the agents of the contractors has led to overexploitation.

Change in listing and commercialization.

Undekayi (Vaate huli), Antuvala (Reeta), Mango, articles prepared from Cane, Bamboo, *Vaatebidiru*, Honey, *Murgalu, Uppage* are the consumptional NTFP's that have now become commercial NTFP's.

4.0 Present Status of NTFP

At present more than 14 NTFPs are sold in the market. The ratio of quantity harvested is increased as against quantity available. Overexploitation is a common phenomenon.

Dependence on consumptional NTFPs:

The demand for several products for household and for agriculture purpose is increasing every year. Fuelwood, fodder. Cane, *Vaate bidiru*, Bamboo, Bamboo shoot, Mushrooms, Honey, *Vaatehuli, Murrugulu, Maada haglu, Ichalu* and Cattle feed, are in great demand for consumption. The need of NTFP for agriculture purpose like green and dry leaf, and for equipment has increased.

There is decreasing trend in certain NTFP is used as vegetables and as medicinal use.

In this cluster, the dependency of different communities on consumption NTFP's is different. Except the minority community, the Christians and *Brahmins* are using more than 85 NTFP species for their domestic requirements. In which edible products are 34, non-edible 8 and medicinal 45. *Poojaris* are collecting 54 products for consumption, 12 are edible, 11 are non-edible and 27 are medicinal. The *Mera* community is collecting nearly 60 NTFP for domestic consumption in which 14 are edible,14 are non-edible, and 31 are medicinal.

5.0 Market Value of NTFP Collected

Table No: 5.6c

Income details of NTFP collected in Karkala cluster 1997-98

S.N.	Product	Quantity	Revenue
1	*Undekayi (Vaatekayi)*	200	8000
2	*Antuvala*	300	1800
3	*Mango*	1000 (nos)	150
4	*Cane articles*	400(nos)	1600
5	*Honey*	300	13500
6	*Murugalu*	250	7500
7	*Uppage*	450	29250
8	*Rampatre*	400	42000
9	*Wild pepper*	150	1200

Marketing channels:

LAMPS is paying royalty to KFD to collect NTFP.LAMPS appoint sub agent in each region. On many occasions, these contractors recruit agents for each NTFP. Thus, the collection of NTFP through the LAMPS has led to the entry of more middlemen into the marketing system. This is the *legal* market channel for NTFP. But there are other *illegal* marketing channels. Illegal traders recruit certain agents to collect the NTFP. They purchase the NTFP from the collectors. Legally, only the tribal communities can collect the NTFP wherever LAMPS exists. But in this cluster non-tribals are also collecting and

the NTFP. In fact both tribal and non-tribals are collecting the NTFP and sell it to illegal agents. This is being done for some of the important commercial NTFPs. The price offered by the illegal agents is higher than the local agents. The collectors also sell certain products to the local market like cane articles, honey and *Vaatehuli.*

Market for new prodcuts of NTFP

Mango (*Appemidi):* There are several varieties of Mango in this region. Out of these only two varieties are best suited for making pickles. Villagers preserve the unripe mango mixing with salt. But now local merchants and small traders have started to sell this variety. The collectors cut the branches of trees to harvest the unripe fruits. Last year (1998) the merchants purchased this mango at a price of Rs 8 per kilogram of unripe mango.

Vaate huli is the other product which is commercialized in recent years. Increased demand for this has resulted in high price. The price was Rs 100 per kilogram of *Vaatehuli* in 1998. More people started collecting. More quanity of *Vaatehuli* is marketed leaving a small quantity for house hold consumption.

6.0 Harvesting of NTFPs

Rampatre- Cutting the trunks of tree or even the green tree is common in recent years. Earlier only the fallen fruit was collected. Number of this tree is decreasing because of destructive of harvesting method.

Wild pepper- Collectors are pulling down the climber to harvest the pepper. This practise has caused the reduction of wild pepper in the forests.

Mango- The collectors especially from outside the village have started to cut down the trunks of the tree to harvest the unripe fruits. They find it difficult to climb the tree and tall trunks, whereas villagers were harvesting the unripe fruit by hand or with a long stick with a hook at the end.

7.0 Legal/Tenurial Issues

The Mala village is surrounded by Kudremukh National Park. The forest around the Durga village (Malebettu region) is a Reserve Forest.

Tenurial systems

Kumki land is an area adjacent to the arecanut and spice garden. During the colonial period, the famers were given two acre of forestland for an acre of *Betta* land. In this patch of farmers have the right to collect fuelwood, fodder, and green and dry leaf for manure. Some of the NTFP's like *Murgalu, Vaatekayi, Seege*, Wild fruits are also available on this land. Only the owners of this land collect the NTFP.To sell the NTFP collected from the area the collectors have to get a special permission from the KFD.

8.0 Gender and NTFP Collection

Time spent by women in processing of *Vaatehuli*, is about two to 3 hours in a year. Male members collect fruits from forest and women members, slice them and process the product. After drying and crushing these slices, they preserve it for consumption.

Figure 5.16 Proportion of income from different sources among different communities in Karkala Cluster

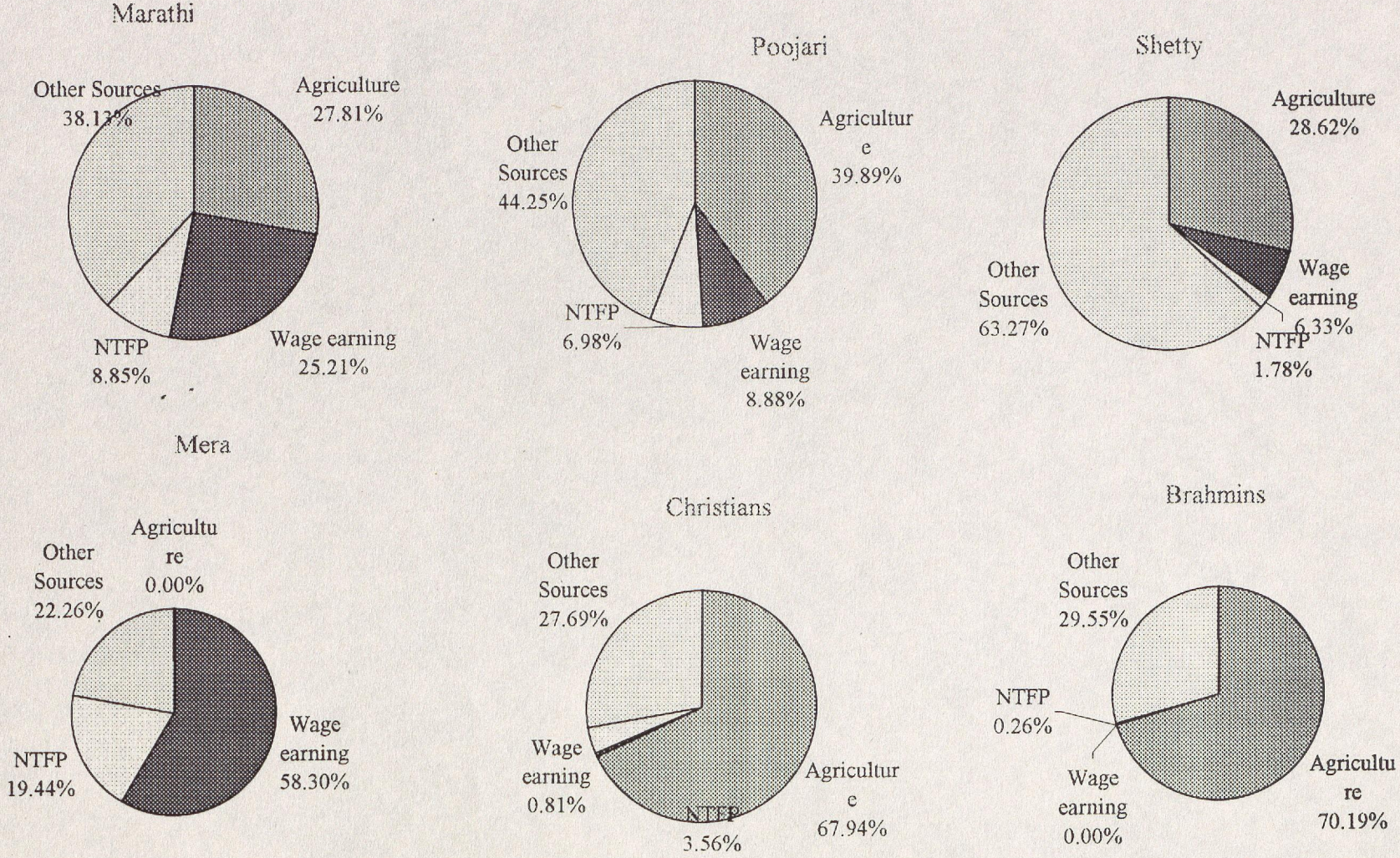
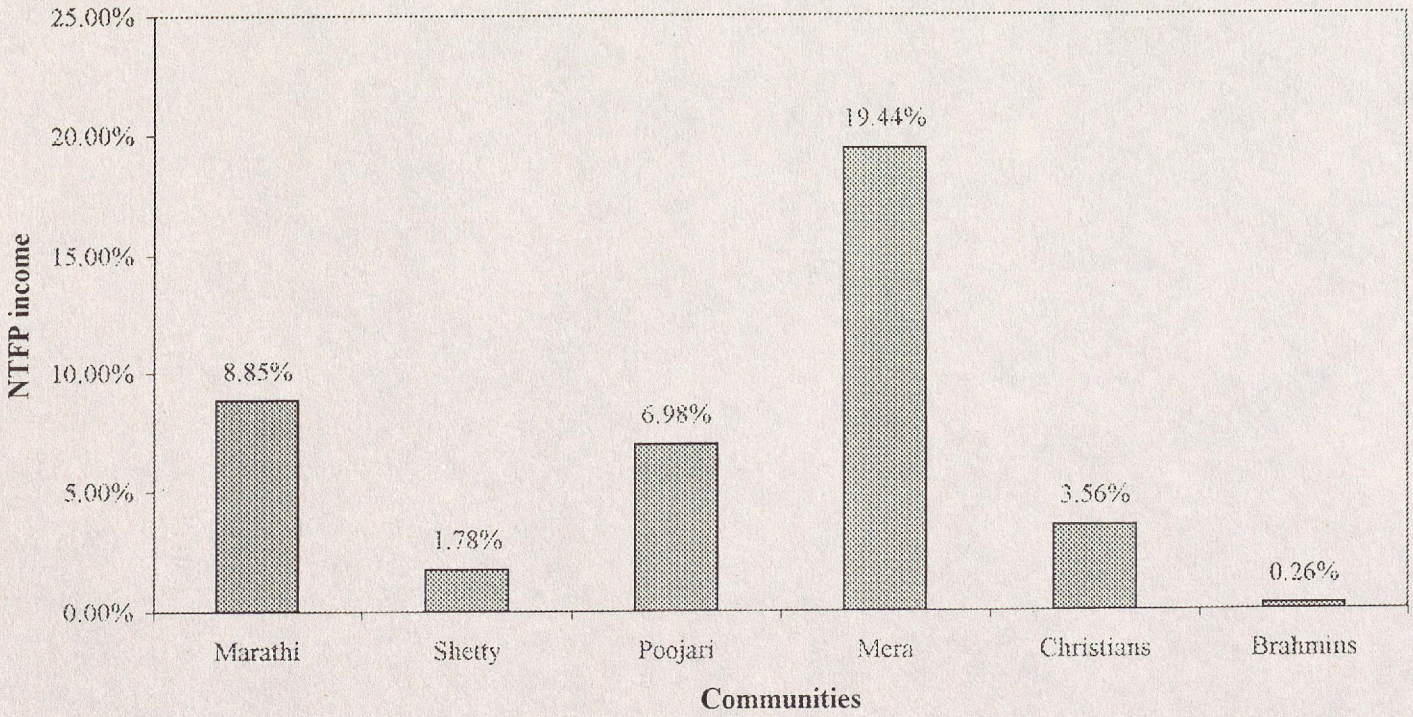


Figure 5.17 Contribution of NTFP income to total income in Karkala Cluster



7.0 KHANAPUR CLUSTER

1.0 Description of Village and Region:

The villages selected for study in Khanapura cluster is Chikale and Kalamani. Both these villages are situated on either side of the Belgaum - Panjim road. Chikale is on the edge of the Karnataka and Goa border. Goa is about 10 kilometers from the village. Chikale is about 22 kilometers from Belgaum, and Kalamani is about 14 kilometers. The forest type is moist deciduous to dry deciduous in both the villages. However, forest in Kalamani is more degraded than the former. Hence, the availability of NTFP is almost similar. However about 12 kilometres from Chikale village there is semi-evergreen forest used by people.

Table No: 5.7a

Land use in Khanapur cluster.

Particulars(area in hectares)	Chikale	Kalamani
Forest area	2071.3	893.2
Geographical area	2,095.8	1,846.8
Other (Cultivable land, common land)	24.5	953.6

Socio-economic status

Dalits and *Marathis* are the communities living in the village. Both these communities are backward communities. Their major income sources are NTFP collection, wage earning. They frequently migrate to neighbouring states in search of employment.

Table No: 5.7b

Population and literacy in Khanapur cluster

Particulars	Chikale	Kalamani
Total family	130	56
Scheduled Caste family	1	9
Total Population	850	326
SC Population	4	62

Literacy:

Particulars	Chikale	Kalamani
Total Literacy%	41	38.8
Male	45.9	51.2
Female	36.1	26.3
Above 10th Std	5.1	1.3

Weaker sections:

Marathis and Scheduled Castes are found to be living under poor conditions. Their income sources are agriculture, wage earning, and collection of NTFP. Agriculture is not economical due to the low fertility of the land. Average income from each acre of land is lower than the any other cluster. The employment opportunity is also limited.

The wage per day in agriculture is Rs.15. Naturally, collection of NTFP is attractive than wage earning.

Dependency on forests:

The villagers of Chikale are more dependent on forest than Kalamani. This might be because of the regional setting of the village. The village Chikale has more forest. They collect NTFP for daily uses.

Occupation: Wage earning and agriculture is major source of income. They grow paddy, and other cereals. Cultivation of sugarcane is also done by some farmers (16%).

People seek employment in other villages, or in cities. Most of the children from the village are attracted towards city.

As the forest type is deciduous, the types of NTFP available are of low economic value. Hence, the overall contribution of NTFP income to family income is comparatively less than the other sources. Nevertheless, collection of NTFP provides employment for four months to the people in these villages.

Villagers are getting 45% of their income from wage earning. Agriculture income is 21% of the total income, trading, and other occupation gives about 22% of total income.

The contribution from other sources is important to people. Many young people are employed in Hotels in the nearby cities. The income from all the sources in this cluster is very low. Villagers have very little land and within this also they are growing mainly food crops, whereas in other clusters the villagers grow one or more commercial crops.

The dry deciduous forest surrounds the village. The NTFP and other forest resources are less in comparision to other clusters. Since the market is far away from the village, the price offered by local contractors is very low. For example, *Harda* is sold at a price of Rs.3 per kilogram and *Dalchinni leaves* for Rs. 1.5 per kilogram. The price of *Guddegeru* is Rs 3 per Kilogram (1997-98).

2.0 Forest Economy

As explained earlier the region is surrounded by moist deciduous forests. The NTFP species are of deciduous type like *Seege, Marking nut* etc. However, unlike in evergreen forests most of the NTFP species available in this cluster carry low income per unit. So even though villagers spend about four to five months in collecting NTFP, they hardly get reasonable income.

NTFP is not an important source of income to the villagers as compared with other clusters. This is due to absence of major commercial NTFP in the area and low price offered by the contractors. The *Marathis* are getting Rs.559 from the NTFP collection per year, which is 8% of their income. Scheduled caste family is getting Rs.653 from the sale of commercial NTFP that is 19% of their total income. Villagers are earning Rs 129975 by selling NTFP in a year.

Role of forests in agriculture:

Ramme (Mukkadaka), a plant commonly found in the region is used as pesticide. Villagers often use green leaves for manure and fodder.

Income from NTFP sale contributes 12% to the total income on an average from two villages. In Chikale village NTFP's contribution to the total income is 14% where as in Kalamani NTFP's contribution to the total income is 9%.

Dependency of weaker sections on forest for NTFP: Both the communities (*Marathis* and *Dalits*) living in the village are weaker sections. Income from NTFP contributes 12% to the total income on an average in two clusters.

State of the forest: The forest in the village is degraded. The forest around Chikale village is comparatively in good condition than that of Kalamani.

Commercialisation of NTFP: Six NTFP are collected commercially. They are *Harda, Seege, Honey, Dalchinni leaves, Vaatekayi,* and *Guddegeru* (Marking nut).

3.0 History of NTFP Collection:

In the past, the region was covered with thick forest. Villagers cultivated ragi, (millet), through shifting cultivation. The Forest Department has banned shifting cultivation. They were forced in to settled agriculture. However, as the region gets heavy rain, the land is barren, due to continuous soil erosion and loss of forest.

Besides, the population has increased rapidly. Employment opportunities are limited. Traditional knowledge of weaving cane baskets was giving certain amount of employment and income. However, the government gave permission to the contractors to cut the cane. The younger generations are unaware of the skills of weaving cane articles.

Collection of NTFP gives employment for about three to four months in a year.

Collections of commercial NTFP like *Kamalpatre (Rampatre), Seege, and Dalchinni leaves* have started about 15 years back. *Harda* and Honey were collected traditionally. But these are used for consumptional than for commercial use. From last 20-25 years, the demand from the outside has increased

Listing of NTFP: Nine NTFPs are used as vegetables, three for making pickle. Honey, *Harda, Seege*, Marking nut are collected by villagers. Honey was used for consumption in earlier days. However, at present almost all families sell honey without keeping for household consumption.

4.0 Present Status of NTFP

Now, Honey, *Harda, Seege, Dalchinni leaves, Hulaga seeds, Nelli* are being auctioned by the Forest Department. Except *Dalchinni* leaves, all other NTFP are collected by villagers. *Dalchinni* leaves are mainly collected by the labourers of the contractor.

There is no major change in the number of NTFP's used by different communities in this cluster. *Marathi* community is using 28 NTFP for their domestic needs in which 16 is edible, 9 is non-edible and 3 is medicinal. *Dalits* are using 24 NTFP for domestic consumption. In which edible species are 8, 9 are non-edible and 3 medicinal.

Kandamool is a rhizome available in the region. This rhizome is being used by the villagers in special festival like *Shivarathri*. This rhizome is boiled, or eaten raw.

Figure 5.19 Proportion of income from different sources among different communities in Khanapur cluster

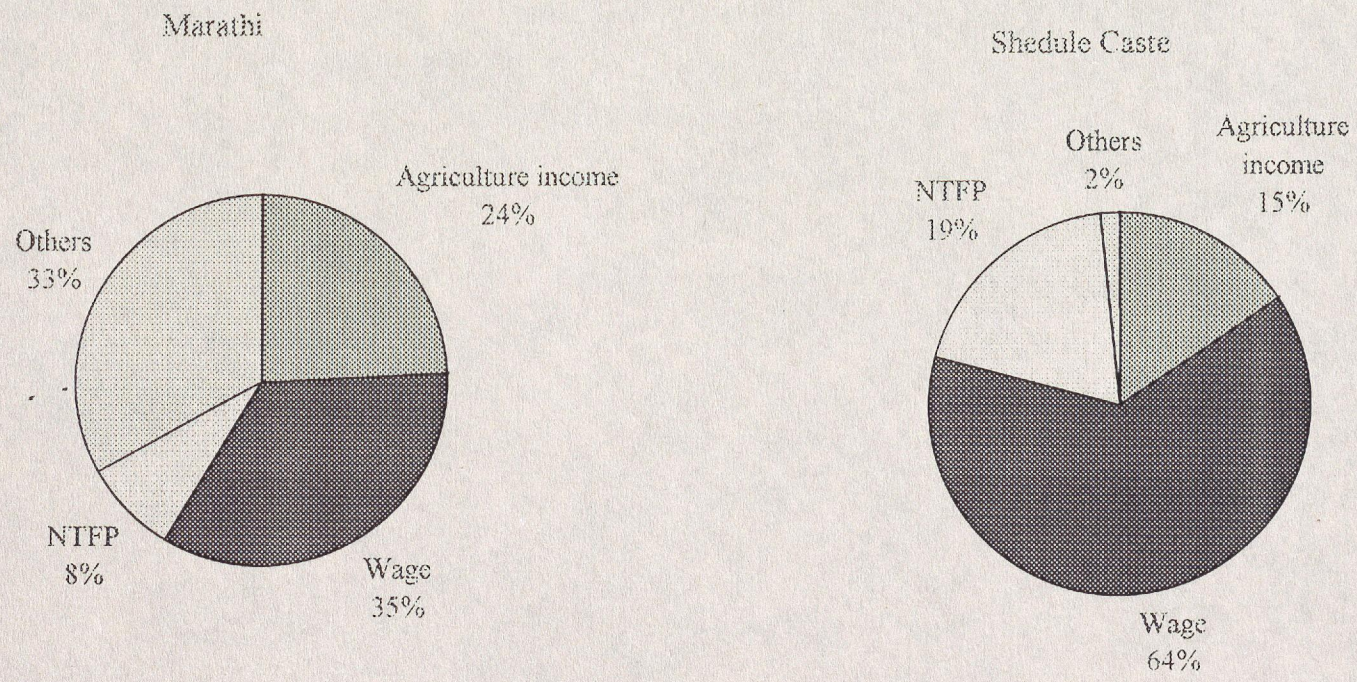
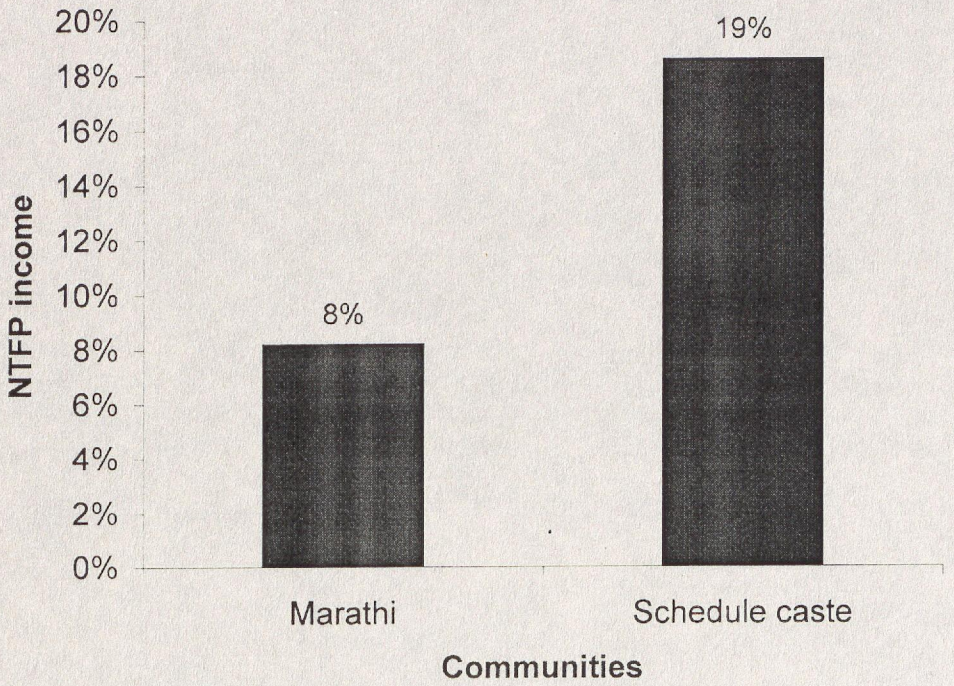


Figure 5.20 Contribution of NTFP income to the total income in Khanapur Cluster



5.0 Market Value of NTFP Collected

Table No:5.7c

Income from commercial NTFP in Khanapur cluster in 1998

S.No.	Name	Quantity		Unit	Price /Unit	Total (Rs)
		Available	Collected			
1	*Harda*	15000	12500	Kg	3.5	43750
2	*Honey*	650	600	Kg	55	33000
3	*Seege*	12500	10000	Kg	5	50000
4	*Dalchinni leaves*	5000	4375	Kg	1.5	6562.5
5	*Vatekai*	75	60	Kg	20	1200
6	*Guddegeru*	2500	2000	Kg	3	6000

Marketing channels:

Contractor system exists here. *Hulagala* seeds are auctioned only in this region.

6.0 Harvesting of NTFPs

Dalchini is being harvested by the labourers of contractors. They are from outside the village and they try to collect as much as possible in minimum time. So, cutting of trees and branches is common. The method of harvesting of *Dalchinni* itself is destructive, as cutting of branches is inevitible. It is not possible to harvest only the leaves.

Possibilities of sustainable harvesting: Education about importance of NTFP and providing alternative livelyhood may help in sustainable harvesting of NTFP.

7.0 Legal/Tenurial Issues

The region is covered by reserve forest.

8.0 KOGAR CLUSTER

1. Description of Village and Region:

Kogar is a village situated about 50 kilometres from Sagar, the taluk headquarters in Shimoga District. The village is covered by dense evergreen tropical forests. The village spreads around distance of 24 kilometres and about 10 kilometres wide. This vast area itself suggests, as it is said by one of the old man of village, that the area was once covered by forests.

Now, the village is separated from the rest of the taluka by the backwaters of the *Sharavathi* Hydro Electric Dam.

It was the village with very little population before the construction of *Sharavath*i Dam. Only families belonging to *Jains* and *Namadharis* inhabited this region. Their houses were spread sparsely deep inside the forests. As there is no education facility, almost all families were unable to continue education.

The Dam was built in 1956. After the construction, most of the families living in the submerged areas were shifted tothis region. They encroached the forest. The dense forests were felled to be converted into agricultural land.

Employment opportunities were limited, as there is no large agriculture land or industries. *Namadharis* are skilled in manufacturing the articles from cane. Cane was available in plenty during the 1950's.

Transport facility is limited, one bus comes to the village in a day. Villagers have to trek to Kogar, covering 15 kilometres.

The region is covered by evergreen forests. A part of the forests in northwest side is declared as the Sharavathi Wild Life Sanctuary, whereas eastern side is covered by the backwaters and west by crestline of Western Ghats, which is part of Govardhanagiri Wildlife Sanctuary.

Table No: 5.8a

Land use in Kogar cluster

Particulars (Area in acres)	Channagonda	Kattinakaaru
Total Geographical area	15793.6	12087.27
Forest area**	3863	208
Gomal	10507	11384
Tank	55.6	6
Kushki	68	9.13
Thari	990	346.16
Bhagayat	20	6.29
Wasteland	21	0
Cultivated land	314	321

* this includes 1264 acresunder *Govardhanagiri Wildlife Sanctuary*,
** Gomal is the common grazing land

Socio-economic status

Description of communities:

Namadharis, Hasalars, Jains and *Brahmins* are the communities living in the cluster. *Namadharis* are the community mainly dependent on forest. Earlier they were farming on the *leased land*, growing paddy. After the implementation of Land Reformation Act, they got small patch of land. Almost all families are poor. Now they live on the paddy and forest dependent activities like collection of NTFP, weaving cane baskets etc.,

Agriculture is the main occupation of *Jains*. Most of the families have small land holdings.

Havyak Brahmins have migrated to this region from the surrounding regions. They purchased the land from the local communities.

Hasalars are the Schedule Castes living in this village. Wage earning and collection of NTFP is the main occupation, along with the farming in their small patch of land.

Table No: 5.8b

Population and literacy in Kogar cluster

Population	Channagonda	Kattinakaru
Total population	935	739
Male	495	405
Female	440	334
Total families	137	108

Literacy

Literacy	Channagonda	Kattinakaru
Male	67.3%	58.74%
Female Literacy Ratio	48.7%	45.87%
Total Literacy %Age	58%	52.3%
Above 10th Class	1.04%	1.86%

Dependency on forests; Forest products are integral part the life for people in the village. The reeds of Vaate *(Ochlandra* spp) are woven as mat and used as wall in their house. On either side of this, mud from the termite's hill is applied. This is the cheapest wall for the houses. This is most common among most *Namadhari* house. *Baine (Caryota urens)* fruit, *Pandavara adike* (Areca dicknoii), and Rangoli chakke are used as pan. Calcium is extracted from the bark of *Matti* tree *(Terminilia arjuna)*

The quilt is prepared by using the wild cotton plant *Boorala hatti* and *Maragaja* (moss). When there is need for cash the reliable source is the forest. They collect NTFPs or manufacture articles from Cane to be sold to farmers.

Forest area comprises of 24.39% where as gomal is 66.34%. On an average 33% of total income comes from the NTFP in this cluster.

Occupation:

According to official records village has more *Gomal* land. There is a tradition of keeping cattle of other areas in summer for grazing. *Namadharis* and *Jains* of this village keep the cattle for grazing. They get remuneration for keeping the cattle. In olden days, this was one of the occupations of villagers. Now this practice is decreasing. In addition, the grazing area has decreased because of the encroachment.

Agriculture is the main occupation. Paddy, arecanut and sugarcane are being cultivated.

Wage earning and collection of NTFP are other sources of income in this cluster.

In this cluster agriculture income accounts for 46% of total income, NTFP income accounts for 33% of total income where as 14% of income is through wage earning. Remaining 7% of income comes from other occupations like trading and employment. *Jains* and *Brahmins* depend more on agriculture for their livelihood where as for *Namdharis* and *Hasalars* the income from NTFP collection is as high as 52% of their total income. In contrast, it is just 1% for *Brahmins*. Among *Namdharis* the contribution

of NTFP income is 42% of the total income.*Jain* community collects more than 186 NTFPs for medicinal use where as the *Hasalars* collect only 15 NTFP for medicinal use.

2.0 Forest Economy

Relation with village/regional settings:

The village is situated between backwater of *Sharavathi* Dam and crestline of Western Ghats. The eastern side of the village is covered by the backwaters and the western side by forests. As there is very meager population, it has very little communication facilities. The only Post Office with twenty-three kilometers range has no runners to distribute the letters.

The nearest market is in Sagar or to Bhatkal. Both these are about 50 kilometers from the village.

Role of forests in agriculture: Villagers utilise numerous plants in agriculture. They include agricultural implements, fiber, fodder, pesticides and manure.

Agriculture implements like plough, levelers are prepared from the forest trees.

Manure: Leaves from the various species of plants are collected as green manure.

Fiber: there are about nine types fiber used by the villagers for tying, making rope, fencing etc. The fibers from *Koulu, Kotrballi, Mukkadaka, Pundi, Baine* etc are used for such different purposes. Thread, rope, and "*dabu*" for tying the cattle are prepared from the fiber of *Pundi* (similar to Jute). Preparation of Baine fiber: The stem of young tree is split and dipped in the water. After about a week or so this is crushed to make fibre.

The slit stem of Baine is used as pipe for transporting the water.

Besides these, fodder and fuel wood needs are met by the forest.

Dependency of weaker sections on NTFP:

Namadharis and *Hasalars* are the backward communities residing in the village. Their income comes from wage earning, and collection and marketing of NTFPs.

They collect more than 65 different NTFPs for household consumption. And they collect more than 10 commercial NTFPs.

General conditions of the village

State of the forest: One side of the village Channagond is covered by the *Sharavathi* Wild Life Sanctuary and the other side is by the backwater of the *Sharavathi Dam*. This

evergreen and semi evergreen type of forest supports variety of plants and animal species; including *Lion Tailed Macaque* endemic to Western Ghats.

In recent years some families from neighboring State migrated to this village and clearfelled the natural forests for growing lemon grass andmedicinal plants. These encroachments are deep inside the forest, about eight to ten kilometers walk from the village, in the thick forests. Besides, clearing of natural forests they are involved in the illegal trade of NTFP from the region.

Encroachment is one of the problems that is responsible for destruction of the forests. Since most of the villagers have small patches of land, they extended their land holdings by clearfelling the forest.

The villagers practice destructive methods while using forest resources. For example they clearfell the area of natural forest to get fuelwood. In this process, unlike in other villages, green trees are felled for fuel wood.

Commercialisation of NTFP: Nineteen types of NTFP were collected by villagers for commercial purpose.

Table No: 5.8c

Number of families involved in collecting different NTFPs in Kogar cluster.

S.No	Name	No of families involved in collection
1	*Alalekai (Harda)*	76
2	*Antwala*	19
3	Cane	80
4	*Dhoopa*	26
5	*Dhoopa- Halamaddi*	38
6	*Ichalu*	76
7	Honey	72
8	*Jummanaharalu*	31
9	*Murugala*	16
10	*Ramaptre (two varieties)*	48
11	*Seege*	28
12	*Uppage*	69
13	*Vatehuli*	72
14	Wild pepper	34
15	*Dalchinni*	12
16	*Maragaja*	16
17	*Vate mats* (Bamboo)	41
18	*Nelli*	22
19	*Neeratti maradakai*	11

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3. History of NTFP Collection:

This region was supposed to be one of the richest areas for Wild Pepper. The Queen of Keladi, was popularly known as *Pepper Queen*. This region was under Keladi Kingdom. Therefore, the villagers opine that marketing of NTFP started around 16th century. However, NTFP collection was limited to Wild Pepper, *Harda*, and other spices only. Cane products like *Butti*, handicrafts had the local demand.

After independence, the KFD started auctioning the NTFP. *Gulamavu, Rampatre*, Wild Pepper, etc were auctioned, -

Commercial demand started from outside.

Listing of NTFP: Badlige Haralu: seeds of this plant are used for extracting oil.

Arishina gurige: (*Garcinia morella*) the seeds of this plant is also used for extracting oil. The seeds are available during May.

The mushrooms are collected from the forests. There are five types of mushrooms recognised by the villagers as edible. They are *Heggali, Haiga, Hallanabi, Dharale anabi* and *Bella anabi. Haiga anabi* is the mushroom, which grows under the tree of *Haiga* (*Hopea sp.)*

Kesa: the leaves of this plant are used as vegetables especially by *Jains.*

Change in listing and commercialisation:

Uppage, Murugalu, Nelli, Cane, *Vaatehuli, Seege* and medicinal plants are NTFP s, which have commercialised in recent years. Earlier these NTFP were used for consumptional purposes. *Uppage* seeds are used by *Havyaks* for extracting oil. *Murugalu* rinds are used as tamarind substitute and seeds for extracting oil, for medicinal uses. *Nelli* is used for making pickle. The fruits are dipped in salt water for two to three days and later it is used. On the other hand, they are sliced and used as spices. Cane is collected for weaving handicrafts. *Vaatehuli* is used as tamarind substitute. Nowadays it has increaed demand from the cities.

Seege was used in household as soap. However, because of increased exposure to the outside world, use of factory made soaps has sidelined the Seege. However, outside demand has forced the forest dwellers to collect this species as NTFP.

4.0 Present Status of NTFP

The main factor, commonly observed from the perspective of villagers is the change in the attitude of collectors towards NTFP. More importance is given to commercial NTFP than consumptional NTFPs.

External pressure: As the price of NTFP has increased, collectors from other, villages started impinging on the forests of the village. They usually come here, camp in the forest for week or so, and collect maximum quantity in minimum time. Price of certain NTFP like *Uppage* has increased sharply.

As prices for some of the NTFP has increased, collectors have also increased. Increased number of collector has resulted in increased pressure on the forest. Due to competition, they cut branches, unripe fruits etc. This has happened for NTFPs like *Uppage, Dalchinni* and *Seege. Malayalis:* some of the families of *Malayali* community, of neighbouring state, are living in the forests. They grow lemon grass and other medicinal plants to extract the oil. They clearfell the forests to grow these grasses. It is reported in recent years that they even grow narotic drugs like *ganja.* They collect the NTFP with high commercial value. In the process they compete with the local villagers to collect these NTFP. They usually collect NTFP in most destructive ways by cutting the branches of tree and harvesting unripe fruits.

Harvesting of NTFP: In recent year the trend indicates that proportion of harvested has increased over the availability of the product. This is true in case of several commercial NTFPs.

Uppage – Collection trend of this produce over the year's show that there is a great difference in quantity available and quantity harvested in the past and at present. During 1970's about 50 quintals of *Uppage* was available in the forest and only negligible quantity of seed was collected. Collection of *Uppage* rind started during 1990 for commercial purpose. More than 40 quintals of *Uppage* was available in the forest whereas only 3 to 4 quintals were harvested. In 1998 whatever the quantity available in the forest is harvested due to high price for the product.The same trend is observed in case of honey and cane. Rise in prices is the main reason for change in harvesting pressure. The harvested quantity has increased with the increase in the price of NTFP.

Dependence on consumptional NTFPs:

Dependence on consumption NTFP is high in this cluster. More than 250 species are collected as consumption NTFPs out of which 125 is regularly used by different communities. But villagers opine that the dependence on medicinal NTFP is decreasing in recent years. Especially *Jain* community was aware of the indigenous knowledge of several plants. In recent years, the number of persons who are aware of the traditional knowledge of medicial plants are rare, especially among younger generation.

5.0 *Market Value of NTFP Collected*

Table No:5.8d

Income details of NTFP collected in Kogar cluster (1998-99)

S.No.	Name	Quantity	Unit	Price /Unit	Total
1	*Rampatre*	3	Quintal	9000	27000
2	*Alale kai*	25	Quintal	300	7500
3	Honey	90	Dabba	1170	105300
4	*Seege*	15	Quintal	700	10500
5	*Dhoopa*	0.1	Quintal	5000	500
6	*Dalchinni Leaves*	4	orry load	12600	50400
7	*Dalchini Buds*	25	Kg	90	2250
8	*Nellikai (wet)*	9	Quintal	300	2700
9	*Misari (Trigona)*	3	Kg	300	900
10	Wild pepper	3	Quintal	9000	27000
11	*Jummanakalu*	0.25	Quintal	1500	375
12	Cane	35	Bundle	35	1225
13	*Ichala chape*	750	Nos	15	11250
14	*Bidiru*	300	Nos	35	10500
15	Cane Products	300	Nos	50	15000
16	*Tharikai*	1	Quintal	200	200
17	*Uppage*	20	Quintal	4500	90000
					362,600.00

Marketing channels:

NTFP is marketed through contract system in this region. The forest Department auctions the collecting of NTFP to contractors. The contractors further recruit agents and sub agents to collect the NTFP. Auction are held for once in two years in Forest Range Certain major commercial NTFP's, like cane, medicinal plants are also marketed through illegal traders. Some portions of the NTFP like honey, cane articles are marketed within the village. There is a Co-operative Society near Kogar. This society gets cane from the department and prepares several articles, and sells the articles elsewhere.

Cane- Contact with out side villages and establishment of a Co-operative Society for marketing of Cane articles has increased export of Canes from this region. Thus more quantity of Cane is being marketed. At present the local farmers are facing scarcity of Canes for their agricultural needs.

Honey- Earlier, when there was no demands for honey, the honey collected was forced to sell or distribute the honey within the village or in neighbouring villages. After commercialisation it is being sold, keeping only a small quantity for domestic consumption.

Uppage- Uppage rind is collected for commercial purpose. It has no impact on local consumption, as the villagers do not use this.

6.0 Harvesting of NTFPs

Pressures and destruction: Fuel wood: Fuel wood collection is being done in a destructive manner. People are cutting the green trees to be used as as fuelwood. Forest is degraded by this method of fuelwood collection.

Harvesting techniques of NTFP have changed with regards to certain products like honey and cane. Big hollows are made to trees to extract honey. This has resulted in reduction of hollows in which the bees can build its hive. Immature and young cane is also being exploited leading to its destruction.

Possibilities of sustainable harvesting: Education regarding sustainable harvesting and use of forest products can help in improving the collection of NTFP. Tenurial inseurity of NTFP forces the villlagers to collect the NTFP in destructive manner.

7.0 Legal/Tenurial Issues

Gomal is the grazing. Gomal covers major portion of the village. Collection of NTFP is done in the forests of the village. The Govardhana Giri Sanctuary, Sharavathi Wild Life Sanctuary, surrounds the village. Villagers collect NTFP from these sanctuaries. According to the rules and regulations of Wild Life Sanctuary, the people are allowed to collect NTFP for their consumptional use. They cannot collect NTFP for sale. Thus, the present activity of NTFP collection in the area of Wild Life Sanctuary is illegal. It prohibits people from collecting NTFP. However, in reality people continue to collect NTFP from this region, ignoring the legal status of the forests.

Figure 5.22 Proportion of income from different sources among different communities in Kogar cluster

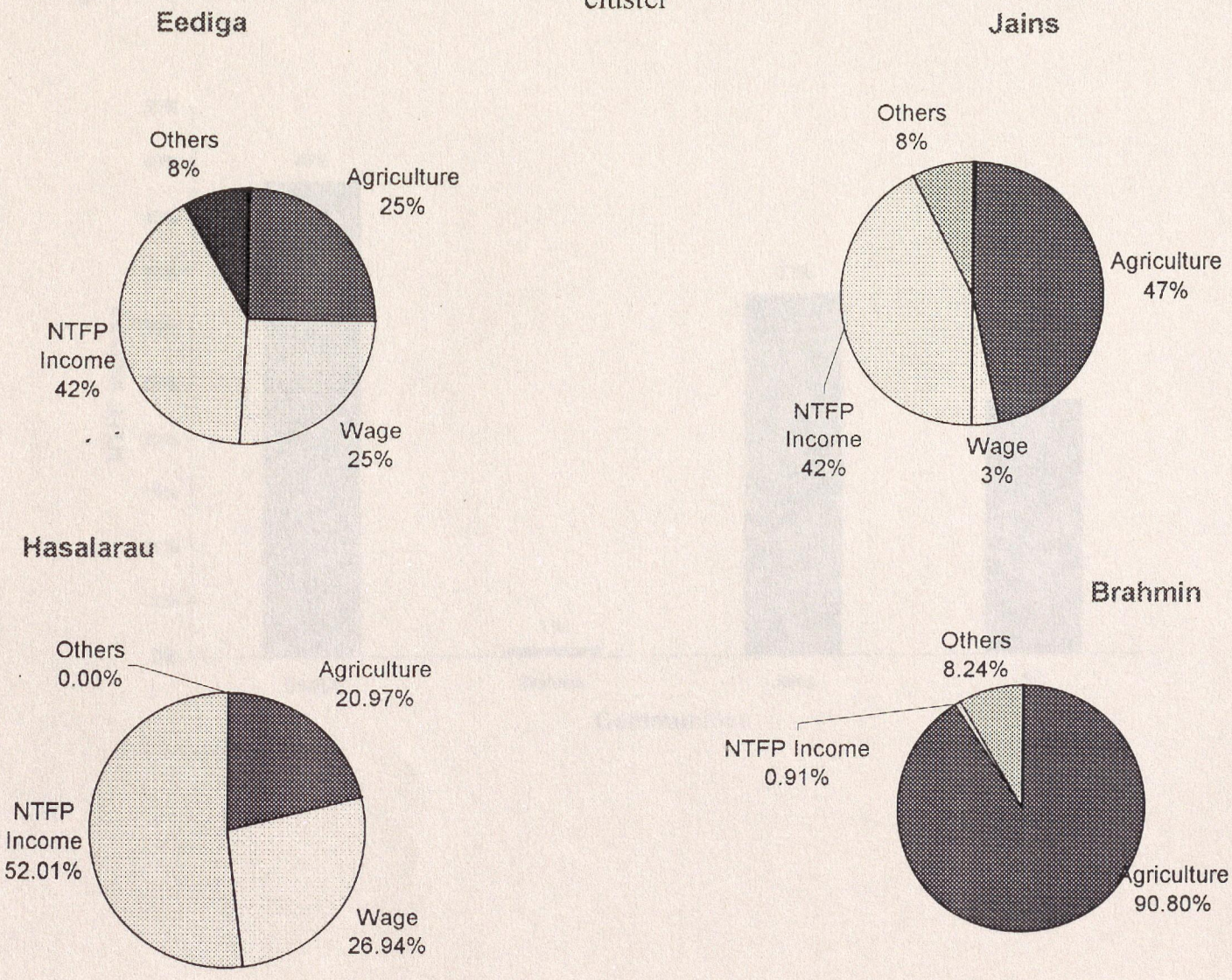
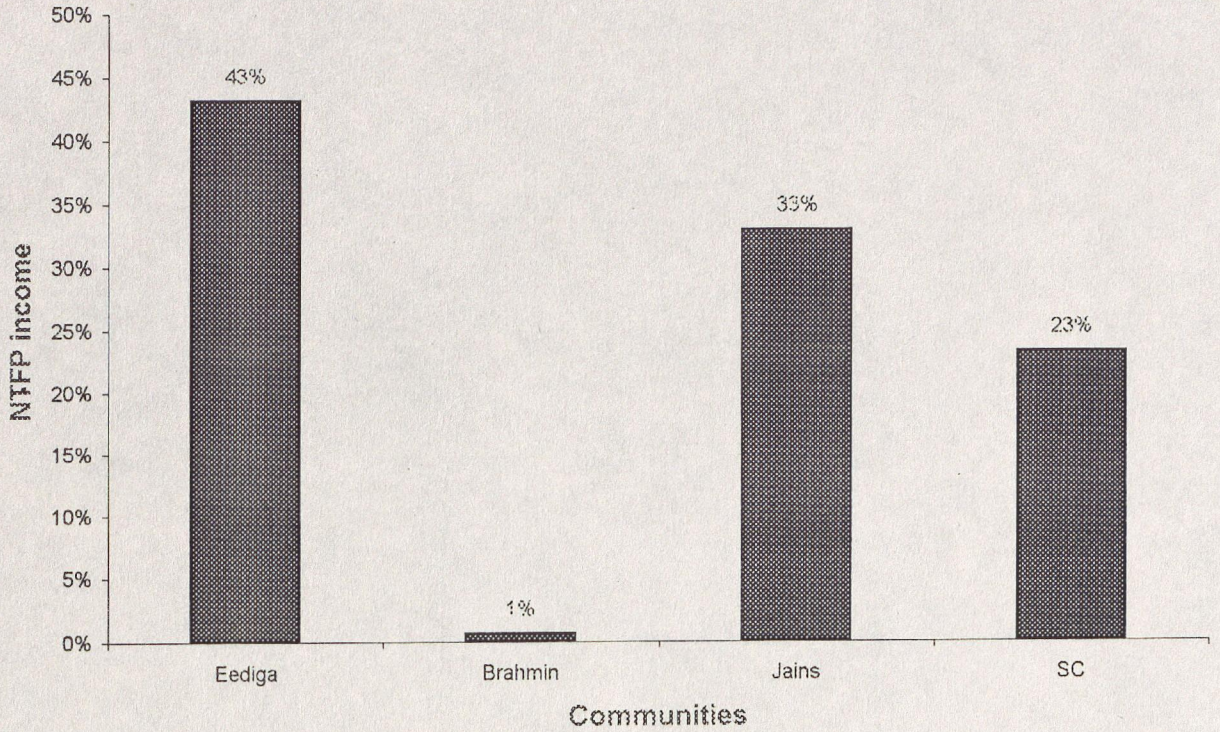


Figure 5.23 Contribution of NTFP income to the total income in Kogar Cluster



9.0 KOLLUR CLUSTER

1. Description The Village and Region:

Kollur is located at a distance of about 47 kms away from Kundapur, the taluka head quarter. It is situated on the foothills of Western Ghats below the famous Kodachadri hill. (Kodachadri is 1,343 meters above mean sea level). Kollur is famous for *Mookambika* temple, one of the important pilgrimage centres. Souparnika River flows near the village. Considering the dense population in the village (2396 according to 1991 census) and vast geographic area, only two hamlets of Dali and Megani are selected for the study.

Dali is located at a distance of 5 kms from Kollur on Kollur – Shimoga road.

It is surrounded by Kodachadri hill range of Western Ghats. *Kunabis, Marathi Naik, Havyak Brahmins, Malayalis* and *Shetty* community is living in this hamlet. Megani-Megani hamlet is selected for the study because of its very peculiar location. Only bridle paths connect the hamlet and there is no motorable road. One has to walk about 8 kms from Megani cross to reach Megani. There is no transportation facility. They carry the goods on head loads.

Divaru Naik families live in this hamlet. Arable land is 34 acres. Both Dali and Megani hamlets are surrounded by *Mookambika* Wild Life Sanctuary. It is covered by thick evergreen forests

Table No: 5.9a

Land use in Kollur cluster.

Particulars	Dali	Megani
Total geographical area	1500 acres	1100 acres
Forested area	1350 acres	1040 acres
Agricultural land	64.14 acres	34 acres
Thalavar (Strip around private land)	46 acres	16 acres

Socio-economic status:

Description of communities: There are six communities living in the village. They are *Brahmins, Kunbis, Marathi, Naik, Malayalis, Shetty* and *Deevaru Naiks*. In Megani hamlet, there is only *Deevaru Naiks*.The land of Dali village belonged to *Gopalakrishna Adiga* of Kollur, a *Brahmin* priest. Later, he sold some portion of this land to others. Thus three *Brahmin* families came to the village. These families brought other communities to the village as agricultural labourers. Later, in 1980's some of the agricultural labourers got the land, through Land Reform Act. There are about 38 houses in the Dali hamlet. They have been living in this region since last 40 years.

Kunbis: They are forest dwelling communities residing in the village. There are about 15 houses in the village. *Kunbis* have small patches of agricultural land. Collection of NTFP, weaving handicrafts, wage earning and agricultural labour is their main occupationi.

Marathi Naiks: Their life style is similar to *Kunbis*. *Brahmins: Brahmins* came to the village about 40 years back. These *Havyak Brahmin* have migrated from Honnavar taluk of neighboring Uttara Kannada district. They grow arecanut, spices, paddy and other agricultural crops. *Malayali*: Two families are settled here, belonging to Kerala. This family has a hotel in Kollur.

Shetty: The two *Shetty* families residing in the village earn the income through employment and Hotel business.

Deevaru Naiks: These communities are living in Megani hamlet. There are about 8 families. Collection of NTFP and agriculture is the major occupation. They grow paddy along with arecanut and spices in small patches of land.

Table No: 5.9b

Population and Literacy in Kollur cluster.

Population

Particulars	Dali	Megani
Population	297	56
Male	165	30
Female	132	26
Total families	35	11

Literacy

Literacy	Dali	Megani
Male	69.8%	52 %
Female	53.3%	38.2%
Total	61.55%	45.5%
Above 10^{th} std	28 %	3 %

There is no school in Megani and Dali hamlets. They have to go to Kollur for education.

Weaker sections: *Kunbis* and *Marathi Naik* are the weaker sections living in the village. They have small patches of land. They came to the village as labourers.

Dependency on forests: It is found that about 96 varieties of NTFP are used commonly in the village. Out of these about 15 are used for commercial purpose. *Rampatre* is the major commercial NTFP. Cane is colleced for making handicrafts. NTFP like *Rampatre*, Cane, *Vaatehuli*, *Murgalu*, Honey are used for both commercial and consumption purpose.

As agriculture is the major source of income every family has to collect forest resource for agricultural purposes. Manure, fodder, fuelwood etc are collected from the neighbouring forests.

In Dali, out of 38 houses, 10 houses have the *bio-gas* plant. Their dependency on fuelwood pressure is high. However, there is no grazing land in the village. This is because, as stated by a villager, the area receives heavy precipitation and thus the rate of regeneration of natural species ishigh. Hence, availability of fodder is less in this village compared to other clusters.

Villagers use variety of climber plants as cattle feed. Most of the agricultural implements are prepared using forest products.

About 32 NTFP is used for consumptional purposes. Out of these 22 is used as food, and 10 types are wild fruit, collected especially by children.

Two persons give medicines in Megani. However, almost all villagers know some of the medicinal plants to treat common ailments.

Occupation: Agriculture is the major occupation of the villagers, followed by NTFP collection, wage earning, and services. Arecanut, paddy, spices like pepper, nutmeg, and cardamom are major income source in arecanut plantation.

Collection of NTFP is the second major income source. Almost all families including *Brahmins* collect highly commercial NTFPs.

As Kollur is the famous pilgrim center for Hindus, small hotels and shops are put up by villagers. There are about 10 families in the village earning from such small hotels.

In this cluster, income source of different communities is not similar as in case of many other clusters. Different communities are involved in different occupations. For *Kunbis* NTFPs is an important income source which is 51% of their total income, whereas agriculture income is 33%. The income from wage earning is 16% of the total income. Among income sources agriculture important like in the other clusters.

2.0 Forest Economy

Relation with village/regional settings:

The village is situated on the foothills of Kodachadri range. The region is covered by thick evergreen forests. The availability of *Uppage*, one of the highly commercial NTFP is less in compqrison to *Rampatre*.

Role of forests in agriculture: Forest is closely linked with agriculture. There are about 100 acres of agricultural land in the village. Manure, fodder and bio pesticide is collected from the forest. Some agricultural implements are prepared by using NTFP available in the region viz., Cane, *Baine, Shivane,* Jack tree, *Vate bidiru,* Bamboo, and several climbers. Collection of dry leaves is done using the basket specially prepared by cane and *Vate bidiru*. *Kasaraka, Lakki, Bacchalu soppu* etc are used as pesticides. Cane resources are available in the forests.

Dependency of weaker sections on forest for NTFP: *Kunbis* and *Marathi Naik* are collecting NTFP for income. They even collect cane and make several types of articles from the same so as to fulfill the needs of farmers of surrounding villagers. They collect NTFP like *Rampatre, Seege,* and Wild pepper. Besides cash income, collection of NTFP gives them employment. It is found that they spend about 105 days in a year collecting NTFP in the forests.

NTFP is the important source of income for *Kunbis*. They get 52% of the total income from NTFP. *Marathi Naiks* get 28% of their total income from NTFP.

General conditions of the village

State of the forest

Dense evergreen forest is present around the village. A small strip of forests adjacent to the agriculture land is encroached by the villagers. They are using this land to collectfeed, fuelwood, fodder, green leaf and dry leaf etc. They are also growing cashew. About 25 years back the Match industry and *Dandeli paper Mill* has selectively logged green trees.. This has lead to destruction of forests and reduction in NTFP species.

3. History of NTFP collection:

About 40 years back collection for commercial purpose started in this region. *Rampatre*, Wild pepper, *Dalchinni buds, Dalchinni bark, Dalchinni leaves, Halamaddi Dhoopa* are collected. Cane articles, *Goragu* are prepared by *Vaate* and *Mundaga* and *Ichalu* mats were prepared and sold locally. Kollur is well connected by roads and transport facilities, number of pilgrims and other visitors increased. The demand increased for NTFP's. Most of the Honey collected in this region is sold in the Kollur. Villagers started to sell the articles made from Cane, *Vaate, Murugalu* to outsiders. The use of NTFP's as vegetable, medicinal plants and agriculture implements is decreasing.

4.0 Present Status of NTFP

Detailed description of present situation:

More than 15 products are sold in this cluster. Unscientific method of harvesting of certain products has led to the decrease in availability of these products. *Halmaddi Dhoopa, Dalchinni bark*, and *Dalchinni leaves* are harvested destructively. Villagers and outsiders started to collect the Wild Pepper by pulling down the climber. Demand for the NTFP has increased and more NTFP have entered the market. As the price of the NTFP has increased, villagers started to sell more quantity of NTFP keeping small quantity for household consumption.

Auctioning of cane: The forest surrounding the village is a 'protected forest' declared as *Mookambika* Wild Life Sanctuary. However, within this region the government auctioned cane in the forestto the contractors. Villagers expressed fear that the availability may be decreased if the contractors go on exploiting the NTFPs.

The price of *Rampatre* is Rs 130/kg in1998. Due to the high price, some people started to collect by cutting the tree or branches of the tree, with the intention to collect maximum quantity within short time.

Entry of outsiders to the forest of the village in recent years by outsiders has led to conflicting situation.

Dilemma in Tender system: As explained in marketing channels LAMPS gets the monopoly for collection of NTFP in the whole Kundapur division. Later LAMPS, gives sub contract to collect NTFP from particular region. This person appoints subagents, and security guards to guard the NTFP. He has the right to collect NTFP from these forests. The villagers work as labourers for collection.

This method is worse than the contractor system. It increases middlemen in the marketing chain. Besides, villagers are not free to collect NTFP directly from forests. They complained some external persons collected the entire quantity of NTFP, although they had no contract for collection.

Dependence on consumption NTFPs:

Villagers, particularly, *Havyaks* use NTFPs for consumption, in their day to day lifeetc are used for making idli, dosa, thambli, chutney respectively.

Appesoppu, Gurige, Atti, Kiranige are used as fodder. *Avugeri,* wild pepper, *Biganasoppu* are used for catching fish.

Dependency on consumption NTFP is more among in *Brahmin.* They are using 152 NTFP species for consumption. Edible NTFPs are 68 non-edible 47 and 37 species are collected for medicinal use. *Kunbis* are using 115 NTFPs for consumption use. Least dependency is observed in Shetty community, they are using only 32 NTFP for household needs.

5.0 *Market Value of NTFP Collected*

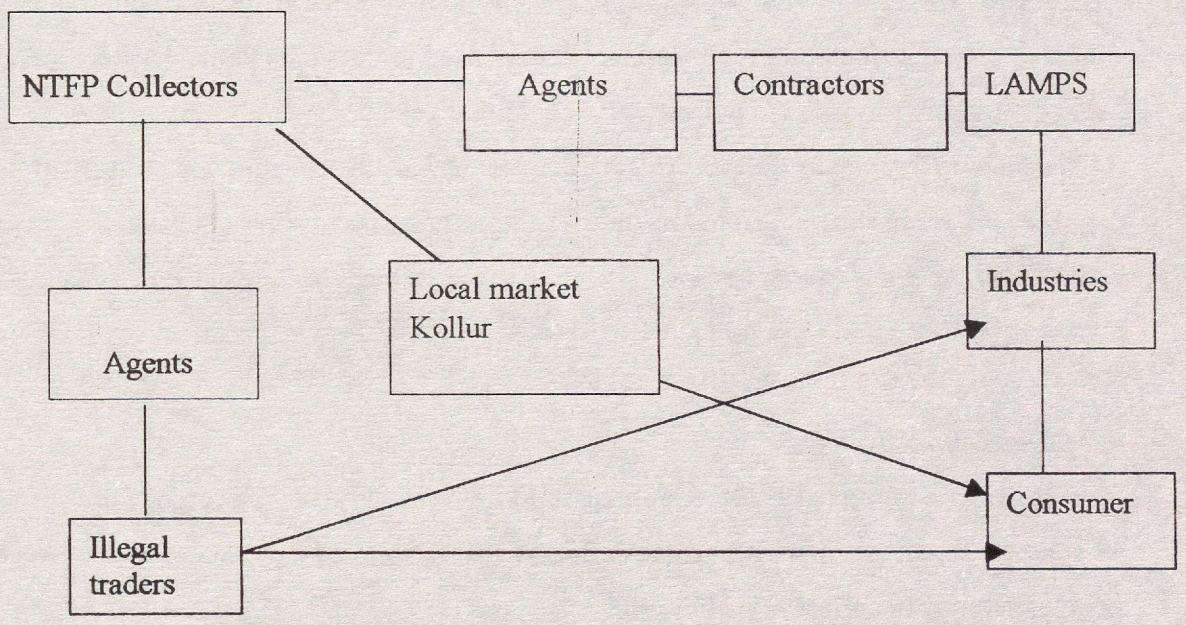
Table No: 5.9c

Income details of NTFP collected in Kollur Cluster: 1997-98

Sl.No	Name Of NTFP	Quantity (Kilograms)	Income (Rs)
1	*Rampatre*	700	77,000
2	*Dalchinni moggu*	95	6,175
3	Honey	250	15,000
4	*Seege*	100	900
5	*Antuvala*	290	1,740
6	*Murugalu*	225	6,750
7	*Uppage*	350	22,750
8	*Vaate huli*	275	14,300

Dalchinni bark and *Dalchinni* leaves, *Dhoopa* and *Halmaddi* are collected illegally by certain agents.

Marketing channel:



LAMPS have permission to collect the NTFP paying royalty to Karnataka Forest Department. In this cluster LAMPS gives sub contract to certain other people to collect the NTFP from the collector. There are many contractors under LAMPS. These contractors further recruit agents to collect the NTFP from the collectors. Some times, there may be agent for each NTFP.Apart from this channel, collectors sell some of the

important products to illegal traders through agents. Certain NTFPs like Honey are sold in Kollur. The local traders in Kollar purchase these products from collectors and sell it to pilgrims.

Market for new prodcuts of NTFP:

Honey, *Murugalu, Uppage*,Cane,*Vaatekayi, Vaatebidiru*, soapnut are the new NTFP's that have demand in the market. But the impact on local consumption is negligible. When the demand and also the price for Honey has increased, villagers sold more quantity of honey keeping only small quantity for their house hold consumption.

6.0 Harvesting of NTFPs

Pressures and destruction:

Harvesting of wild pepper - Earlier, collectors were using the ladder or they were climbing the tree to harvest the wild pepper and hence the harvesting has been done in a sustainable manner. But at present the collectors are pulling down the climber or cutting the trees to harvest the wild pepper.*Rampatre*- When the price increased, the collectors started unscientific method of harvesting. They started to cut the branches of tree or even the tree. Earlier, they used to collect only the fallen fruit.

Possibilities of sustainable harvesting: Villagers opine that tenurial insecurity is the major reason for unsustainable harvesting. The present marketing system is another major reason. If these problems are solved , it is possible to harvest the NTFP in sustainable manner.

7.0 Legal/Tenurial Issues

The cluster is surrounded by Mukambika Wildlife Sanctuary. No special tenurial rights exist here. Legally the people can not collect NTFP from Wild Life Sanctuary. However, people continue to collect NTFP.

Problem of ownership rights: The strip of land around the patta land of each farmer is locally called as "*Thalavar*". There is no legal support to this system. However, the owner of the patta land enjoys the right. Cashew nut is grown here. Fuelwood, fodder and NTFP like *Ichalu* and *Rampatre* is collected from this area.

Figure 5.25 Proportion of income from different sources among different communities in Kollur Cluster

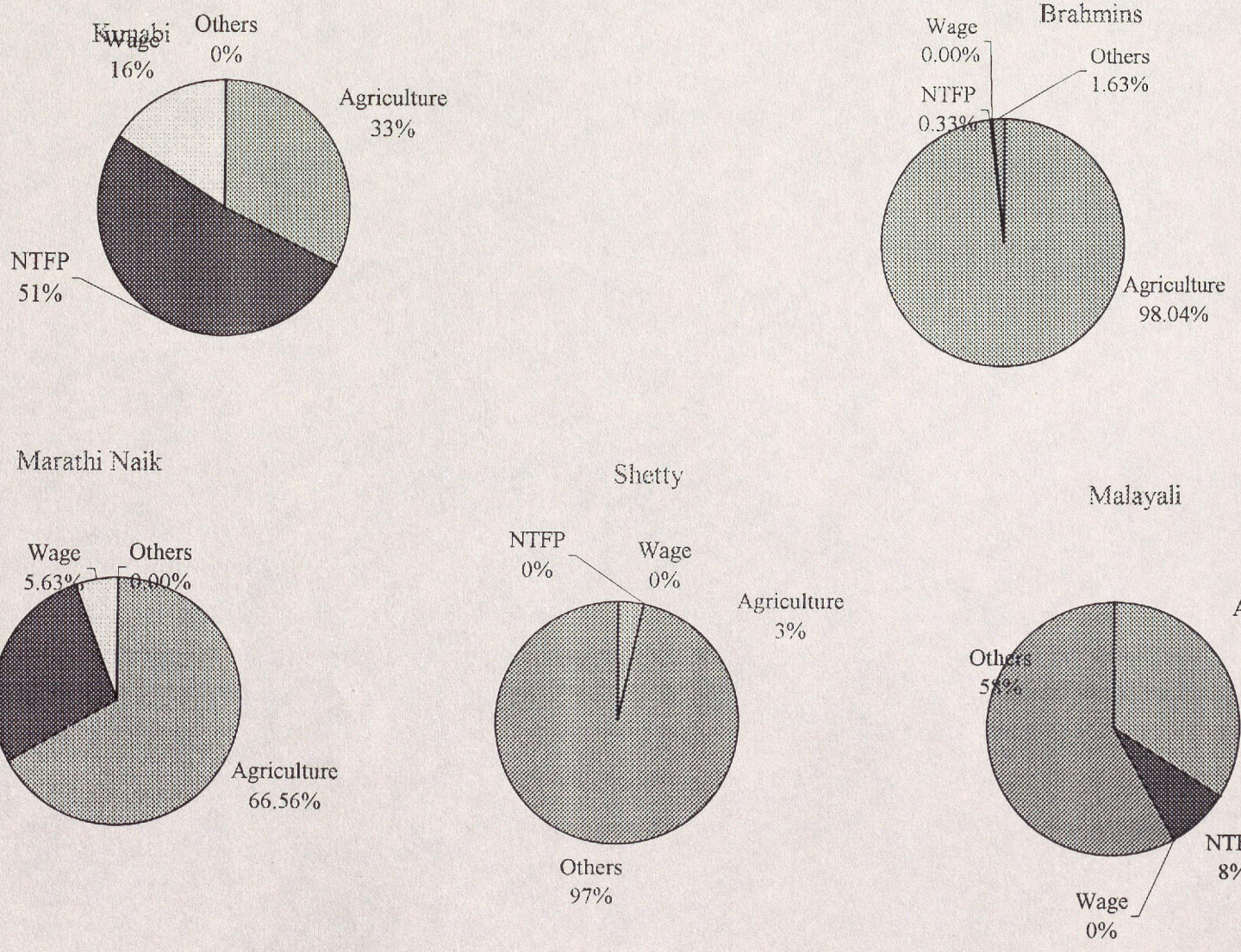
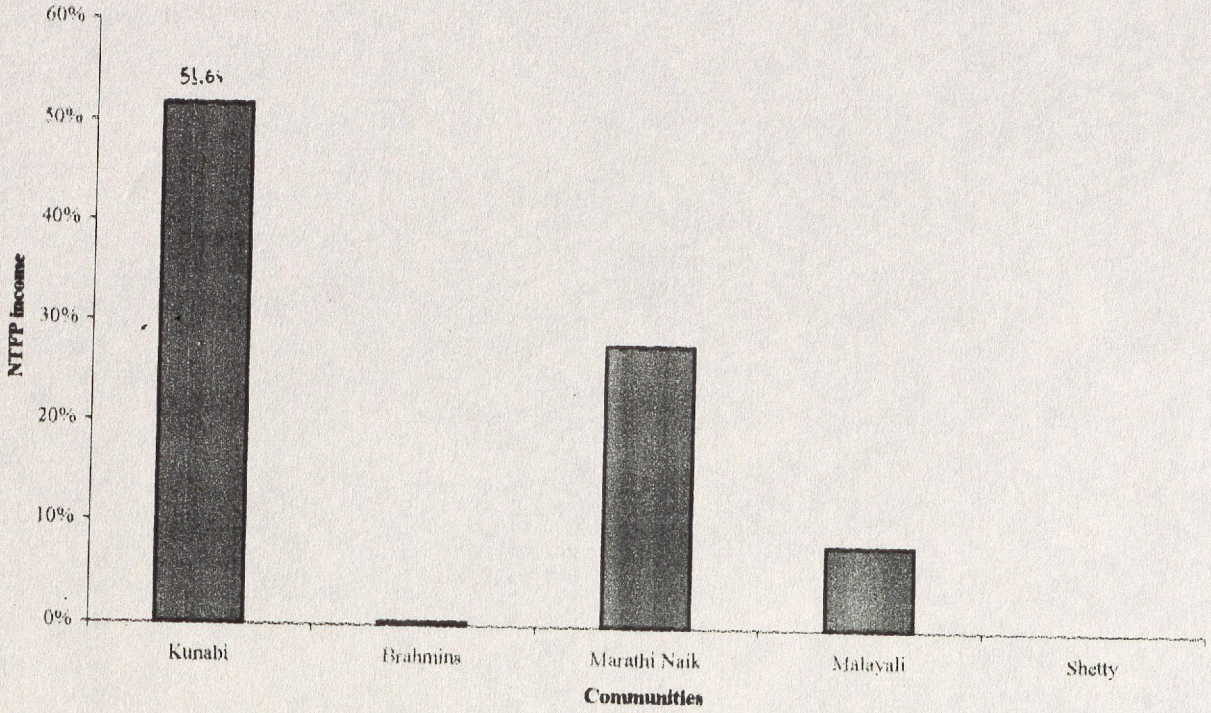


Figure 5.26 Contribution of NTFP income to total income in Kollur Cluster



10.0 MAGOD CLUSTER

1 Description of Village and Region:

Magod is about 14 kms from Yellapur, a taluka head quarter of Uttara Kannada district. This area is under the purview of Idagundi range of Yellapur Division. The area is hilly, surrounded by evergreen to moist deciduous forests. The villages selected in Magod cluster include those with a high of forest cover from wet evergreen to deciduous forests. Known for its scenic landscape, Magod is particularly famous for its 'Magod falls' on the Bedti River.

Table No: 5.10 a.

Land use in Magod cluster

Particulars(Area in hacters)	Magod village
Geographical area	5491.33
Agricultural area	216.34
Forest land	5129.32

Villagers in the study hamlets of Magod cluster belong to different classes broadly along caste lines. Some of the families of the neighbouring villages are also selected for the study to include the communities involved in NTFP collection.

Socio-economic status

Description of communities:

The main community residing in this area is the *Siddis* known to be of African descent, but settled in India for centuries and living in close proximity to the forests. Other communities are the *Naiks* and *Havyaks*. Apart from these, there are also some families of *Patgars*, *Madivals* and *Marathis*.

Havyaks as in other clusters have areca plantations and economically better off than others.

Table No: 5.10 b.

Population and Literacy in Magod cluster:

Population	Magod village
Male	318
Female	293
Total	611

Literacy	Percentage
Male	53%
Female	46%
Total	49.2%
Above 10^{th} std	25%

Weaker sections:

Siddis are the weaker sections living in the village: Most of them are landless labourers. They have encroached small patch of forestland. However, in recent years, they got land the Land Reform Act and regularisation of encroached forest land. They have been living in the forests by collecting the NTFPs.

Dependency on forests:

The income generated from the collection of NTFP accounts for 23% of the total income. This is natural in a region so rich in biodiversity. The NTFP available here is used both for commercial purposes and for subsistence. The NTFP species available in this region include 1) Cane, 2) Honey, 3) *Uppage*, 4) *Murugalu*, 5) Va*atekayi*, 6) *Dalchinni*, 7) *Rampatre*, 8) *Seege*, 9) *Jummanakai*, 10) *Wild peper*, 11) *Kalale* (Bamboo shoot), 12) *Koolballi*, 13) *Kodasina beru*, 14) *Chakrani beru*, 15) Dhoopa, 16) *Itle ele*, 17) *Gandhasoor*, 18) *Atlakai*, and 19) *Alalekai*.

It is observed that as the income of a family increases, the proportion of NTFP income to this total income decreases. For the lowest income group, i.e. those earning less than Rs. 5,000 a year, the largest portion of their income viz. 72% is from NTFP collection. This could be attributed to the low income available from NTFP collection as compared to

other sources like agriculture and wage earning. Unfortunately, for groups without access to these sources of income, NTFP income, despite its relatively meagre income generating potential, becomes the only viable option to earn cash.

An analysis of the dependency of villagers on NTFP income v/s agricultural income reveals similar trends. The greater the land holding and the greater the income generated from agriculture, the less is the proportion of NTFP income to the total income from agriculture. As the table above shows, families without any agricultural land and no income from agriculture get about 47% of their income from NTFP. For those earning less than Rs.5,000 annually from agriculture, NTFP collection and sale contributes 30% of their income. On the other hand, only 5% of the income of those earning between Rs.50,000- 1,00,000 is from NTFP sources.

Finally, the trend repeats itself when data on wage earning and NTFP is analysed. As we move from those with no land to those with an income of less than Rs.1000 per annum from wages we find the dependency on NTFP relatively high, i.e. 100% and 79% respectively. Higher the dependence on wages, less the contribution of NTFP to the total wages earned. NTFP income contributes to 24% and 21% of those earning wages of between Rs.5,000- 10,000 and Rs.10,000 and above respectively.

From the above analysis it becomes obvious that though all communities and occupational groups get some amount of income from NTFP, the range of income is very widely dispersed. The dependency of the poorest groups on NTFP income is much higher than for other groups either with land holdings or wage earning potential. In Magod cluster, it is the Siddis that are most dependent on NTFP. Close observation and secondary data sources reveal that the greater the dependence of a community on NTFP, the more symbiotic the relationship of that group with the forests.

Occupation

The main crop grown in the region is paddy, rice being the staple food of the people. Apart from this, arecanut is also grown mainly by the *Havyaks* and the *Naiks* as they are the communities with the most land and they can afford the initial investments that are needed for arecanut cultivation. The total income from arecanut earned by the families in the study sample was Rs. 1,86,600 of which the average earning by a *Havyak* family per

annum was Rs.17,000, whereas for *Naiks* and *Siddis* these figures were Rs.7,000 and Rs. 857 respectively.

Paddy, on the other hand, is grown by some of the land owning *Siddis,* however few these may be. Income earned by the *Siddis* in the study sample was an average of Rs. 1537 per family per annum, compared to Rs. 5,500 and Rs. 7,257 for the *Naiks* and *Havyaks* respectively. This shows that though the Siddis depend far less than the *Naiks* and *Havykas* on all forms of cultivation the difference in paddy cultivation are not as marked as they are for areca between the three communities.

Overall, less than half, viz. 21 families in the sample population own land ranging from smallholdings by the *Siddis* to large tracts by the *Havyaks*. In all, income from agriculture contributes 27% of the total income from different sources obtained by the villagers in Magod cluster.

A more important source of income than agriculture to the villagers is wage earning. This contributes 38% of the total income generated annually by the sample studied. The data on wage earning corroborates other studies done in this field revealing an inverse correlation between land owning and wage earning. The more the land a person has, the less the reliance on earning an income through wage labour. In this sample, it is therefore clear that the communities that have not much land viz. the *Siddis* are more dependent on wage earning as compared to the *Havyaks* and *Naiks*. The amount of dependence of the *Siddis* on wage earning as compared to the other communities can be seen from the following data. Rs.8, 773 are the average income from wages earning per family for *Siddis* whereas this is Rs.7567 for the *Hayaks* and *Naiks*. Of the total income earned by the *Siddis* i.e. Rs. 6,86,900, wage earning forms 48%. For the *Havyaks* and *Naiks* on the other hand, wage earning forms 19 and 31% of their total income respectively. Therefore, we can see that *Siddis* are far more dependent on wage earning for their income than the other two communities, the dependence being the lowest among the *Havyaks*.

While income from wage earning and agriculture consists of 38% and 27% of the total income obtained by the villagers in the sample, income generated from the collection of NTFP is not far behind. It accounts for 23% of the total income, a substantial amount, natural in a region so rich in biodiversity

2.0 Forest Economy

Role of forests in agriculture: Green leaves are collected for areca plantations as manure. The humus from the forest is used as the manure for all types of agriculture crops. Fencing is done by using the poles. Fodder and Fuel wood are the integral part of rural life. Handles for knife, and other agriculture equipment are made from wood. Leaves of *Amla* (nelli) are used as pesticide for paddy. Also these leaves are used as manure. Fiber is made from six types of climbers. Cane is also used as fiber along with making handicrafts.

Dependency of weaker sections on forest for NTFP:

Siddi community is considered as weaker sections of the society. They are the communities depend heavily on NTFP. They are collecting more than 16 NTFPs for commercial purpose in which *Rampatre*, Seege, Honey, *Uppage*, and Wild Pepper are important products. Apart from commercial NTFP they are collecting more than 100 species for domestic use like for manure, fodder, wild fruits, vegetables, pesticides, cattle feed, edible oil and for medicinal use.

General conditions of the village

State of the forest: The government proposed to build a dam site to Bedti river near Magod. In 1969, they cleared more than100 acres of forest to construct the dam. Besides, few more acres of forest were cut down to establish a colony for workers. This has destroyed the forest cover in this region.

Logging: The KFD has harvested of dead trees in the forest. Roads were made inside the forest to transport the timber. Villagers opine that several green trees were felled along with dead trees.

Encroachment: Some of the *Siddi* families and *Patgaars* have encroached the forest and converted it as *betta* land to fulfill the need for manure.

Commercialisation of NTFP:

Table No: 5.10c

Percentage of NTFP income with respect to other income sources in Magod cluster

Agriculture income	% of NTFP income
Nil	47%
0 to 5,000	30%
5,000 to 10,000	28%
10,000 to 25,000	14%
25,000 to 50,000	16%
50,000 to 1 lakh	5%
1lakh and above	0%

Total income	% of NTFP income
Below 5,000	72%
5 to 1,00,000	47%
10 to 25,000	27%
25 to 50,000	21%
50 to 1 lakh	11%
above one lakh	0%

Wage earning	% of NTFP income
land holders	16%
no land	100%
below 1000	79%
1000 to 5000	44%
5000 to 10000	24%
10000 and above	21%

3.0 History of NTFP Collection:

In the past the NTFP was collected only for domestic purpose except Wild Pepper. About 75 years back only *Havyaks* and *Siddis* lived in this village. *Patgar* families came to cultivate land. Earlier only the *Havyaks* had agriculture land. Agriculture equipment, manure, fibre, cattle feed, fuelwood, fodder and bio-pesticide was collected from the surrounding forests. But the *Siddis* are living in the forest. Wild fruits, roots, wild animals are the main source of food for them. In recent years they encroached forests and started to cultivate crops.

Change in listing and commercialisation: Honey, *Cane*, *Seege* are the consumption NTFPs that have now become commercial NTFPs. Improved communication is the main reason for increased demand for NTFPs.

4.0 Present Status of NTFP

Detailed description of present situation:

At present more than 16 NTFPs are harvested for sale. Ratio of quantity harvested over quantity available has increased. Number of collectors for commercial NTFPs has also increased, considering high price and demand.

Dependence on consumptional NTFPs:

Dependence on consumption NTFP is decreasing in general. Earlier the *Siddi* community lived mainly on NTFP to fulfil their food security but now the situation has changed. In the past they used to make powder of *Baine* kernel as staple diet. This practise is discarded. The sap was extracted in large quantity in the past. This is reduced in recent years. Dependency on several NTFPs have increased which are used for agricultural purpose like green leaf, dry leaf, *Kangobbara*, agriculture equipment etc. Whereas dependency on medicinal NTFPs and NTFPs, which are used as bio-pesticide etc is decreasing in recent years.

5.0 Market Value of NTFP Collected

Table No: 5.10d

Income details of NTFP collected in Magod cluster (1998-99)

Name of NTFP	Quantity	Price/Unit (Rs)	Total Revenue
Rampatre(Kg)	1100	110	121000.00
Seege(Kg)	4800	6	28800.00
Honey (Kg)	500	45	22500.00
Uppage (Kg)	500	45	22500.00
Wild Pepper(Kg)	1000	80	80000.00
Cane articles(Nos)	1500	35	52500.00
Murugalu (Kg)	1200	18	21600.00
Vaatekayi(Kg)	800	40	32000.00
Dalchinni (Kg)	300	120	3600.00
Jummana haralu(Kg)	600	25	15000.00

Contractor system exists in this region. Collectors sell major commercial NTFPs to local agents of contractor. The contractor sells it to industries and to factories. But due to lack of knowledge of market many times they are forced to sell the product to the contractor at a lower price. Cane articles, Honey etc are marketed the village.

Market for new prodcuts of NTFP

Honey, cane, *Murgalu, Uppage, Antuwal* are the new produce which have entered the market and have impact on local consumption. High demand for Honey and increased price has led to villagers selling more quanity of honey, keeping a small quanity for household consumption. The Forest Department gave contract to harvest the cane about 15 years back in this region. The contractors harvested young and immature canes at one time which reduced the availability of canes in this region. Now the demand for cane article has increased. But sufficient quantity of cane is not available in the region. Farmers have to purchase the cane articles from the artisans. Earlier rind of the ripe *Murugalu* fruit and the oil was extracted from the seed to be used for various domestic purposes. But after commercialisation unripe fruits are harvested even by cutting the branches or green tree.

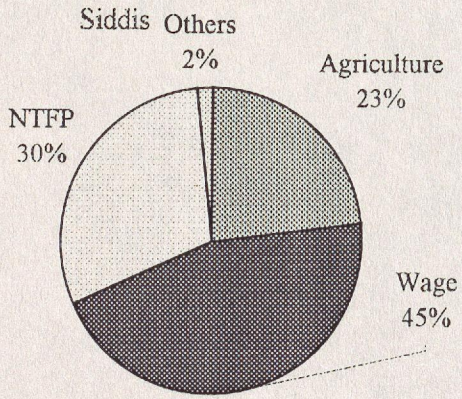
6.0 Harvesting of NTFPs

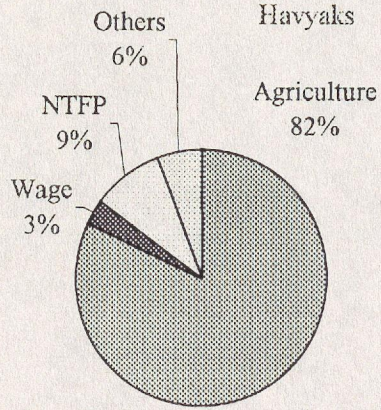
Pressures and destruction: Harvesting techniques have changed over the years. Collection of unripe fruits by cutting branches of the tree or felling of the entire tree is becoming common to harvest *Murgalu, Uppage* and *Rampatre*. Hollows in the trees are being destroyed to harvest the bees. Pulling down the climber is done to harvest the *Seege*. These methods are posing a severe threat to the resource base of NTFP.

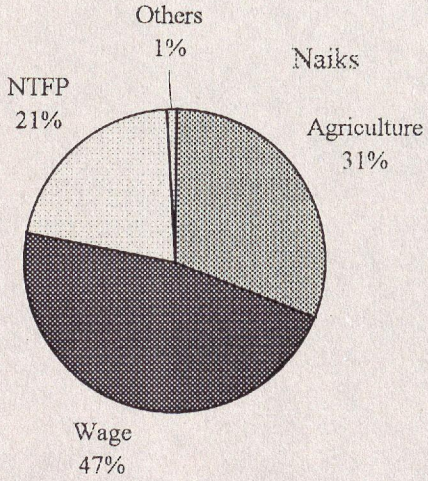
7.0 Legal/Tenurial Issues

The state of the forest surrounding the village is Reserve Forests, owned by government. Besides, the farmers have *betta* land surrounding the spice garden. *Seege, Antuwal*, Honey, wild fruits etc are present in the *betta* land. Only the owner of the *betta* land has the legal right to collect the NTFP.

Figure 5.28 Proportion of income from different sources among diferentcommunities in Magod cluster







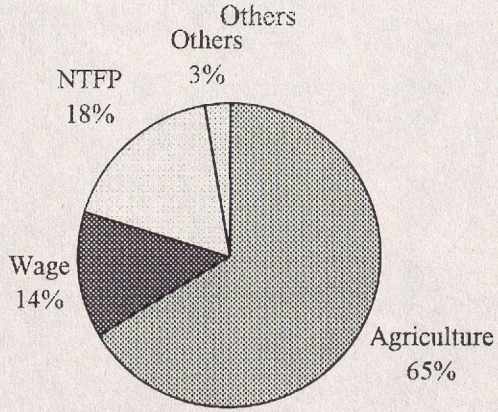


Figure 5.29 Contribution of NTFP in total income in Magod cluster

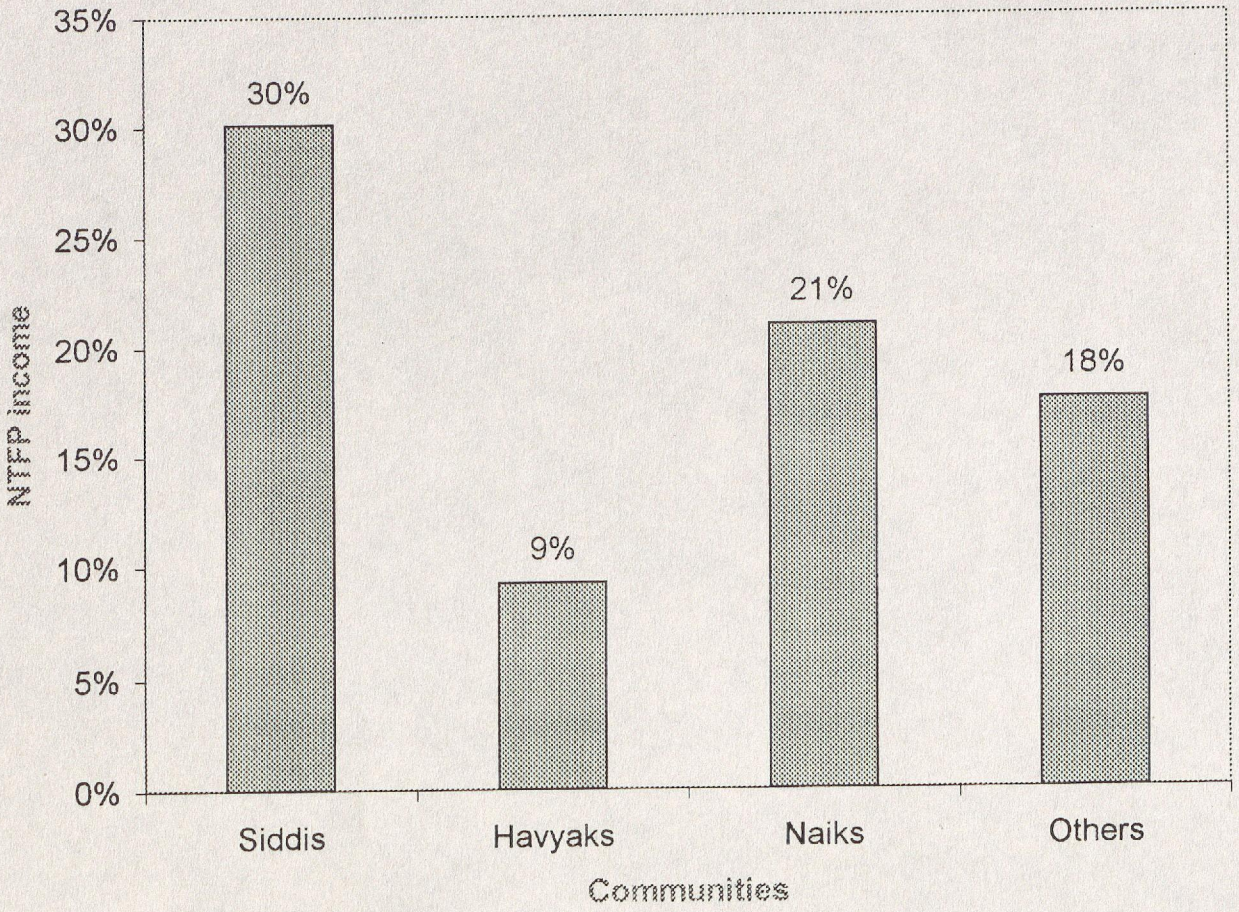
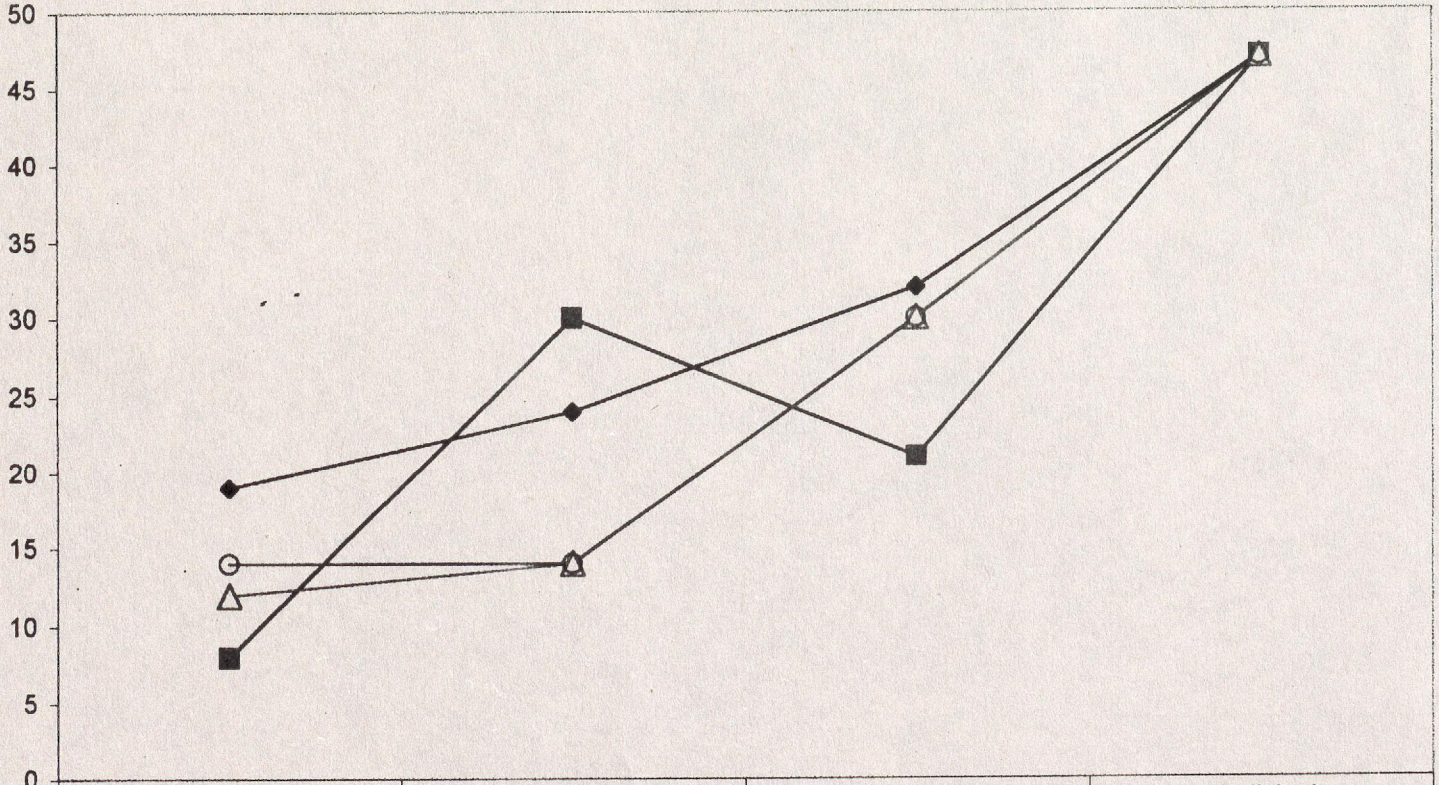


Figure 5.30 Type of NTFPs collected by different communities in Magod cluster



	Commercial	Edible	Non-edible	Medicinal
Siddis	19	24	32	47
Havyaks	8	30	21	47
Naiks	12	14	30	47
Others	14	14	30	47

11.0 MALGI CLUSTER

1.Description of Village and Region:

Malgi is situated about 36 kms from Mundgod, the taluka head quarters. Most of the region is on the plains, covered with dry deciduous forests although there are a few patches of moist deciduous forest. Situated on the edge of Western Ghats this cluster is exposed to various pressures. The forests are highly disturbed and degraded.

Two villages around Malgi have been selected for the study. One is Kurli, situated at about five kms from Malgi towards the southwest direction, primarily inhabited by the *Namadharis* and *Voddars*. The second village is Bankanal cross, situated at about 12 kms on the south east of Malgi, near Dasankoppa. *Lambani* is the main community residing in this area.

The selection of the villages covers the entire range of communities in the Malgi area and also ensures that most of the NTFP available in that area are in these villages. This ensures that the nature of dependence on NTFP by the local communities in the sample can be generalised to an extent to other villages in the same geographical area.

Table No: 5.11a

Land use pattern in Malgi cluster.

Area in acres	Kurli	Bankanal
Geographical area	680.00	1800.00
Forest area	430.00	1025.00
Net area sown	250.00	620.00

Socio-economic status

Description of communities:

Namadharis: They are the communities living in the village, with small patches of agricultural land and works as agriculture labourer. They also collect NTFP to support their income.

Voddars: They are popular as stone workers. They have very little land. They go to the *Malnad (*hilly) region as agricultural labourers. They also do the collection of NTFP.

Lambanis: Communities who can be identified by the colorful dress stitched with mirrors. Because of little employment opportunities they also migrate to *Malnad* region

Havyaks: They are *Brahmins,* migrated from *Malnad* region by purchasing land from the villagers. They are areca growers. They have considerable amount of arecanut plantations.

Muslims: They are landless. Trading is the main occupation along with collection of NTFP.

Table No: 5.11b

Population and Literacy in Malgi cluster.

Population	Kurli	Bankanal cross
Male	169	282
Female	159	250
Total	328	532

Particulars	Kurli	Bankanal cross
Male literacy %	42.51%	39.32%
Female literacy %	38.34%	34.26%
Total literacy %	40.43%	36.79%
Above 10^{th} std.	18.45%	12.56%

Weaker sections: *Lambanis* and *Voddars*, are weaker sections. They are unable to get good income in dry land. Employment opportunities are also limited in the region.

Dependency on forests: Forest products are integral part of villagers daily life. Collection of green manure, dry leaves, fodder and fuel wood is the common. In rainy season Mushrooms are collected by all non-*Brahmin* families. Besides leaves of plants like *Kesu, Elavarige* are used as vegetables.

Occupation: Agriculture in the major occupation. Aagriculture dominates over all other sources, with more than 60% of the income coming from agriculture.

Of the entire sample, 20 families did not earn any income form paddy cultivation. This constitutes more than 30% of the sample, a high figure considering the fact that agriculture is the main income-generating source in the area. Further, we can see that the

main source of agricultural income is paddy and areca accounts for a relatively smaller amount. This is easily explained by the dry deciduous (with some moist deciduous patches) nature of the forest. This is again the factor, which explains the relatively low wage earning, as Forest Department work is likely to be lower in such situations.

Eight families, i.e. approximately 12% of the sample population are engaged in areca cultivation. All these families are also dependent on paddy cultivation as a source of income. The income earned from paddy ranges between Rs.1, 000- 20,000 per annum whereas that from areca is distributed between the Rs.2000- 13,000-income range per year. The area under areca cultivation is very small, never exceeding more than 2 acres whereas for paddy some families own up to 5 acres of land. The smallest landholdings for both paddy and areca are half acres.

Wage earning contributes to 20% of the income of the sample population in Malgi. About 31% of families did not earn any income from wages. The families who did depend on wage earning as one of their income sources earned in the range of Rs.1,000 - 10,000 per annum. Only one family earned Rs. 16,000 annually from wages. This family, which has a total of 7 members, 5 of which are capable of working, does not own any land and does not earn income from any other source apart from wage earning.

While wage earning accounts for 20%, the share of NTFP is very low at just 6% of the total income of the villagers. This is understandable given that this cluster is situated in the plains, with the forest cover being relatively sparse and the variety and amount of NTFP available being limited. Also, the commercial value of NTFP available in this area is comparatively less than the NTFP in other clusters. Unlike in the other clusters where practically all the families irrespective of caste or class depended on NTFP for at least some portion of their income, in Malgi given the scarce forest resources, many families did not earn any income from NTFP. 24 families out of the sample i.e. almost 39% of the population did not earn any income from NTFP. This seems to cut across caste lines. Finally, income from other sources accounts for 13% of the total income of the villagers, in this cluster.

The distribution of the villagers along different income groups shows that about 41% of the families earn less than Rs.10,000 per annum while the remainder earn more than this. Only 12% of the families have an income of over Rs.25,000 per year, which shows a

pyramidal structure of wealth distribution in the cluster. This means that this is one of the poorer clusters. This is obvious given the extent of forest degradation in that area and the inadequate sources of alternative employment.

2.0 Forest Economy

Relation with village/regional settings: Compared to other clusters, the forest resources are low because of the dry deciduous type of forests. Commercial value of NTFP available is low compared to the NTFPs available in the evergreen forests.

Role of forests in agriculture:

Manure, fodder, fuel wood are collected from the forests. Fencing material and agricultural implements were also made from the trees in the forests. However, dependency is low among the villagers, as the new techniques like electronic fencing, gobar gas plant are becoming popular in the village.

Dependency of weaker sections on NTFP: About 26 types of NTFP are collected by villagers for commercial purposes. Mushrooms, *Jambekai*, *Dalchinni*, *Mullannu*, *Karibevu*, *Wild Pepper*, etc are collected by weaker sections. Some of the families collect wild fruits like *Mullannu* and sell them in Malgi or in Sirsi. In addition, they collect Mushrooms and *Kalale* (bamboo shoots) for commercial purpose.

Voddars get about 21 % of their income from NTFP. *Lambanis* get about 23.15% of their income from NTFPs. For weaker section it is estimated that about 60 to 75 days of employment is through collection NTFP. However, income earned by collection of NTFP is much lower compared to other clusters. This is because low priced NTFPs of deciduous forest.

General Condition of Village:

State of the forest: The forest type surrounded by the village is dry and moist deciduous.

Data on NTFP and its contribution to total income as well as its relation to land holding, agricultural income and wage earning was analysed. The results were the same as in the other clusters. For those earning below Rs.10,000, NTFP income contributed to 16% of their total income whereas it accounts for only 1% of the total income of those earning between Rs.25,000 - 50,000.

Table No: 5.11c

Percentage of NTFP income to income sources in Malgi cluster

Income from Agriculture	
No land	17%
Below10000	14%
10000 TO 25000	2%
Above 25000	0%

Total Income	
Below 10000	16%
10000 to 25000	7%
25000 to 50000	1%
50000 and above	0%

Income from Wage Earning	
Land holder no wage earners	3%
Landless no wage earners	21%
Below 1000	14%
1000 to 5000	2%
5000 to 10000	3%
10000 and above	0%

Land holdings	15%
0 to 1	15%
1 to 2	9%
2 to4	9%
4 and above	2%

NTFP income contributed to about 2% of the total income of those owning more than 4 acre of land whereas this contribution steadily increased as the size of land holdings decreased. Therefore, that owning less than 1-acre depended on NTFP for 15% of their income.

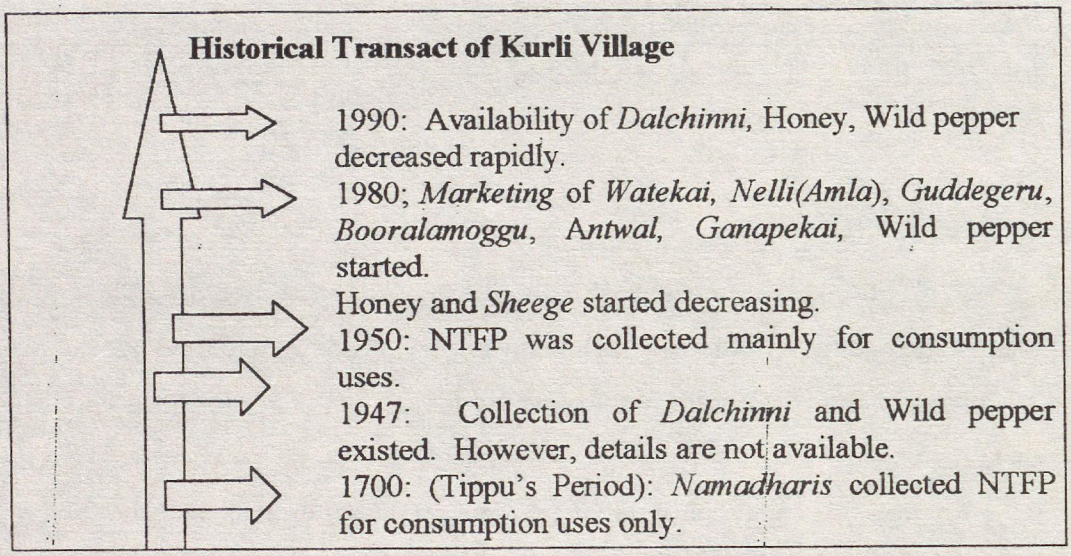
The same trend continues when data on agricultural income v/s NTFP income is analysed. The landless families rely on NTFP income to 17% of their total income whereas NTFP income contributes of only 2% of the income of those earning between Rs.10, 000 - 25,000 per annum.

Families earning wages of between Rs.5, 000 - 10,000 depend on NTFP for 3% of their total income. This dependence increases as income from wages decreases. Those without any income from wages or land rely on NTFP collection and sale for 21% of their total income.

The same trend continues when data on agricultural income v/s NTFP income is analysed. The landless families rely on NTFP income to 17% of their total income whereas NTFP income contributes of only 2% of the income of those earning between Rs.10,000 - 25,000 per annum.

From all this we can see that a clear inverse relationship exists between NTFP income and income from agriculture as well as total income. The relationship is not so clear in the case of wage earning, but one can clearly infer that NTFP income is higher the lower the other sources of income. There is also an inverse (though less marked) relationship between NTFP income and land holding. This reiterates the general conclusion found elsewhere that poorer groups are more dependent on NTFP as a source of income.

3.0 History of NTFP collection:



Change in listing and commercialisation:

JambeVodu (The shell of seed of *Jambe*), Seeds of *Hulagala, Anabe* (mushrooms), *Ganapekai, Guddegeru, Kalale, Mullannu* are some of the NTFP which have acquired market demand recently. Some people collect NTFP, in lean period, and sell them in the nearest market like Malgi and Sirsi.

4.0 Present Status of NTFP:

The villagers collect about 49 NTFPs. Of these 26 are collected for commercial purpose, 12 for edible, 8 for non-edible and 3 for medicinal purpose. Earlier they were collecting about 82 types of NTFPs with only three for comercial purpose, 30 for edible, 25 for

medicine and 24 for nonedible purpose. Now NTFPs are collected mainly for commercial purpose.

The following chart shows the present picture of available NTFPs.

Table No: 5.11d

Inflow and out flow of NTFP in Malgi cluster

	Name of NTFP	Quanity available in forest	Inflow from Forest	Consumed in Village	Quantity sold Market (outflow)	Unit	Price (Rs) Per Unit	Distance
1	*Anabe*	5000	2000	500	1000	Nos	50/100	3
2	*Boorala moggu*	200	25	0	25	Kgs	25/Kg	4
3	*Chalanakai*	100	10	10	0	Kgs	*	*
4	*Dalchinni*	2	2	0	2	Quintal	50/Kg	4
5	*Dhoopa*	25	5	5	0	Kgs	30/Kg	6
6	*Ganapekai*	200	10	10	0	Kgs	3/Kg	4
7	*Guddegeru*	1	0	0	0	Quintal	2/Kg	4
8	*Halasu*	2000	1500	500	1000	Nos	10/Fruit	2
9	*Honey*	10	7	2	5	Dabbas	50/Bottle	6
10	*Hunagala beeja*	2	1	0	1	Bags	2.50/Kg	4
11	*Jambekai*	25	10	0	10	Bags	*	4
12	*Kalale*	10000	1000	750	250	Nos	2/Kg	4
13	*Karibevu*	15	10	1	9	Quintal	******	4
14	*Kavalikai*	200	25	25	0	Kgs	*	3
15	*Maragesu*	10	5	5	0	Kgs	*	2
16	*Mavu*	10	5	1	4	Bags	30/100	1
17	*Mullannu*	200	100	75	25	Kgs	1/Packet	3
18	*Muttala ele*	10000	na	500	0	Leaves	*	4
19	*Nelli*	100	1	1	0	Bags	*	4
20	*Nerale hannu*	100	15	15	0	Kgs	*	4
21	*Nurukalu hannu*	100	2	2	0	Kgs	*	2
22	*Sampige hannu*	100	5	5	0	Kgs	*	4
23	*Seege*	5000		10	1000	Kgs	8/Kg	6
24	*Tarebeeja*	50	2	0	2	Quintal	40/Bag	4
25	*Vasagesu soppu*	25	1	1	0	Kgs	*	6
26	*Vatehuli*	5	5	2	3	Quintal	*	2
27	*Hippe huvu*	5	2	2	0	Kgs	*	4
28	*Nooregadde*	5	4	4	0	Kgs	*	3
29	*Masalesoppu*	10	2	2	0	Kgs	*	5
30	*Dindala antu*	5	5	0	5	Kgs	20/Kg	4
31	*Wild pepper*	15	15	15	0	Kgs	20/Kg	4

Marketing channels:

1. Local Sale: *Kalale, Mushrooms, Mullahannu, Honey* etc are sold locally. Fuelwood is collected from the forest and sold in Malgi.

2. Self-Help Groups: With the support of local NGO *Vikasa*, villagers formed SHG. NTFPs are collected and marketed through these SHG. They sell NTFP directly to the contractor bypassing the middlemen. This has helped them to earn Rs 2- 4/ more than. They sell NTFPs, directly to the consumers.

3. Contractor system- This is the major marketing channels in the village Government auctions some of the NTFPs to the contractor. *Seege, Harda, Dalachini, Kasaraka* (*Nux vomica*) etc are sold to the contractor.

5.0 Market Value of NTFP Collected

Table No: 5.11e

Income from NTFP collected in Malgi cluster: (1997-98)

	Quantity collected	Price(Rs) /unit	Total income (Rupees)
Jambekayi	25 bags	25/bag	625.00
Wild pepper	3 quintals	1500.00	4500.00
Karibevu	5 quintals	250.00	1250.00
Mullannu	25 kgs	20.00	500.00
Honey	3 quintals	7500.00	22500.00
Halasu	500 nos	15.00	7500.00
Seege	15 quintals	600.00	9000.00
Vatekai	2 quintals	2500.00	5000.00
Boorala moggu	25kg	30.00	750.00
Dalchinni	2 quintals	85.00	170.00
Mango	5000 nos	15.00	1250.00
Mushrooms	500 nos	2.00	1000.00

Market for new prodcuts of NTFP:

Teak and, Hulagala seeds, are collected by villagers to be sold to the Forest Department. The collection of seeds has increased the income increased the income of the villagers and also provides some employment during the lean season. *Jambe Vodu*, (Shell of the fruit) is used as fuelwood. This is bing collected by villagers. It marketed for Rs 25 per bag in Sirsi, the nearest town.

Availability of honey has decreased. Even small quantity of honey collected from the forest are sold. Hence honey is not available for local consumption.

6.0 Harvesting of NTFPs

Pressures and destruction: Increased price of some of the NTFP, like *Dalchinni* buds, Seege (the, price is decreasing), has resulted in unsustainalble harvesting of these products. Cutting of whole vine of Seege is common. *Dalchinnni* trees are on the verge of extinction from this region.

7.0 Legal/Tenurial Issues

Villagers collect NTFPs from Reserved Forest. After formation of Village Forest Committees V.F.C.s under, it has imposed restriction on the traditional collectors to harvest NTFP. This has lead to the conflict between the traditional collectors and VFC members. No special tenurial systems are operating in the village.

8.0 Gender and NTFP Collection

Table No: 5.11f

Gender and NTFP collection in Malgi cluster
(Average no of hours spent in collection in a year)

	Men	Women	Children
Commercial	265.35	274.61	35.65
Edible	165.54	184.36	42.35
Non edible	23.65	36.24	15.95
Medicinal	5.84	6.32	0.21
Total	460.38	501.53	94.16

Decision Making

Men	Women	Both	Children
41.68%	36.01%	21.21%	1.10%

Money from NTFP is used for

Particulars	%of responses
Family expenditures	26.54%
Personal use(men/women)	64.61%
Not known	8.85%

Men and women spend almost equal time in collecting commercial NTFP in Malgi cluster. However, in case of edible NTFP women spend more time than men. Nearly equal numbers of hours are spent both by men and women in collecting the medicinal NTFP.

Although women spend more time in collection and processing of NTFP they do not have any say in decision making process.

Figure 5.31 Proportion of income from different sources among different communities in Malgi cluster

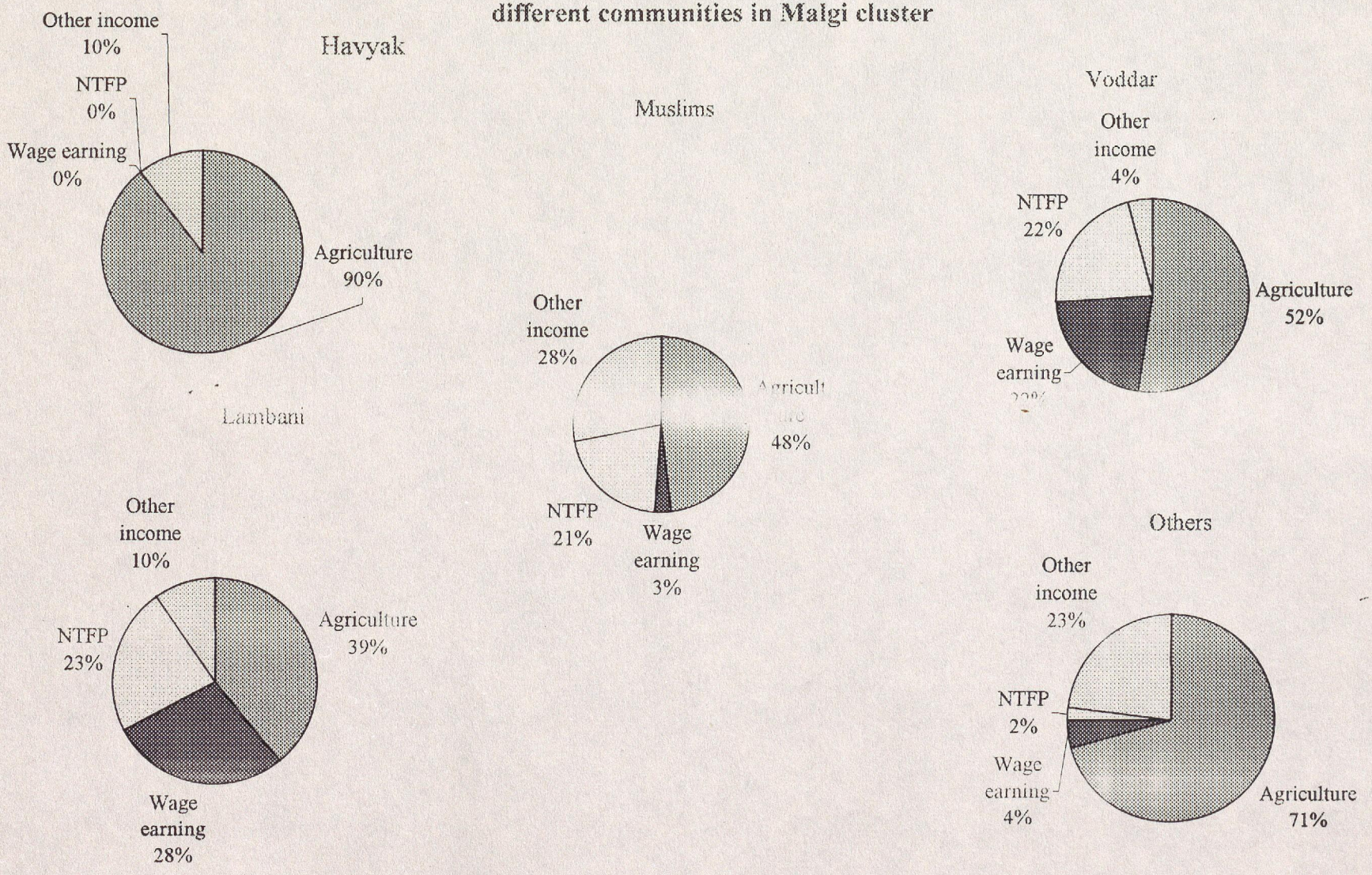
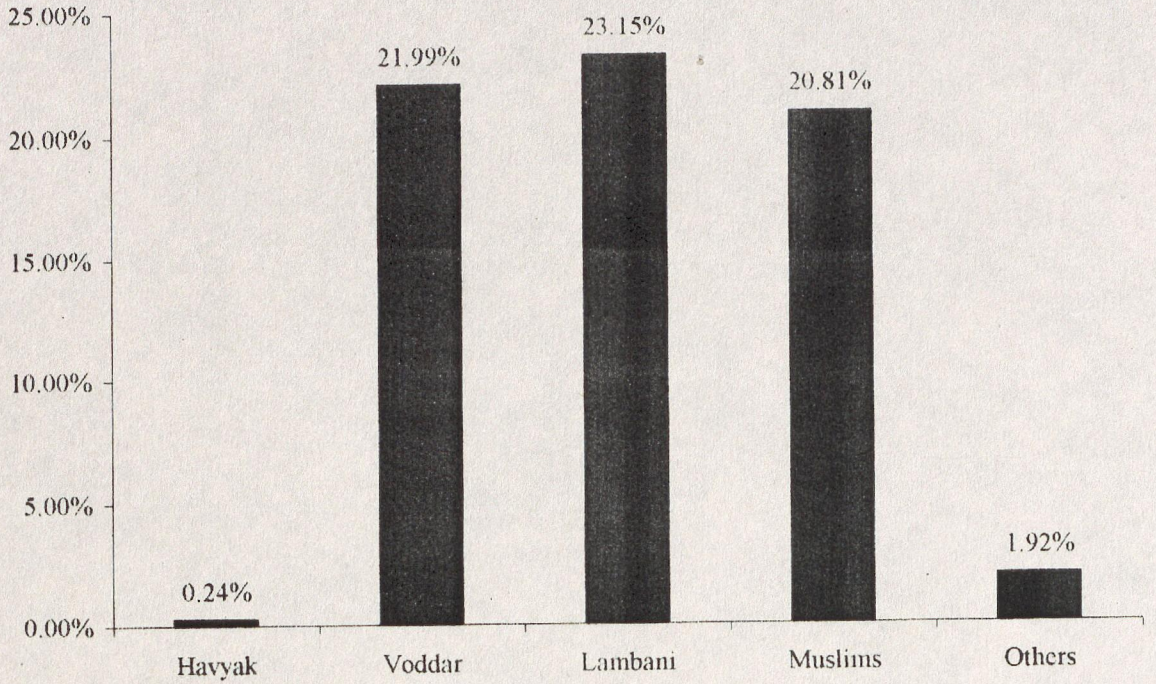


Figure 5.32 Contribution of NTFP to total income in Malgi cluster



12.0 MOODIGERE CLUSTER

1.0 Description of Village and Region:

The two villages selected for study in Moodigere taluk are Hanumanahalli and Taruve. Taruve is situated at a distance of 23 kilometers from Moodigere, and it lies on the crestline of Western Ghats. Hanumanahalli is situated at about 8 kilometers from Moodigere.

In Taruve village, as it is situated on the crestline, soil erosion is high because of heavy rainfall. Due to leaching of soil, the soil fertility is low. Unlike the other study village Hanumanahalli where most of the land is converted into coffee plantations. In this village major cultivable land is under paddy cultivation. In coffee plantations the wage per day is high (Rs 75 per day) compared to Taruve (Rs.50 per day).

Most of the farmers are small have marginal land, engaged in paddy cultivation. However, in case of Hanumanahalli most of the area is converted into coffee plantations. The land under paddy and other food crops were converted into commercial coffee plantations. The forest area has decreased due to the change in land use.

Table No: 5.12a

Land use in Moodigere cluster

Particulars(Area in acres)	Taruve	Hanumanahalli
Paddy	413.21	12.00
Forest	420.00	56.25
Gomal	990.00	-------
Coffee plantation	107.03	356.08
Barren land	28.21	16.00
Others	202.66	42.12
Total	2161.11	483.12
** Most of the coffee plantations are established on Gomal.		

Forest Type: In the western side of the village Taruve forest is dense with evergreen type of forest, on the southern side of the village is the Reserved Forest.

Description of communities: There are about 120 families in Taruve village and about 41 families in Hanumanahalli. In Hanumanahalli there are *Vokkaligas* (20 families), *Hasalars* (Scheduled Caste)(20), and one *Brahmin* family. In Taruve, along with *Vokkaligas, Brahmins, Hasalars*, there are *Badagis, Christians*, and *Muslims*. There are about five families of *Malekudiyas*.

Badagis: They are carpenters residing in Taruve village.

Hasalars, Harijans (SC): They are part of backward communities, and landless labourers working in the coffee plantations. *Malekudiayas*: A tribal community living near the forest.

There is only one *Brahmin* family in these villages. They have migrated from the neighboring district.

Socio-economic status

In Hanumanahalli, the coffee planters posses huge wealth and families own more than five vehicles in a family, which shows great change in the living style. The plantation owners have become absentee land lords who recruit Farm Managers to run coffee plantations. They do not use the NTFP's for household consumption. Several coffee plantations were also established in the Taruve village.

Table No:5.12b

Population and Literacy in Moodigere cluster

Particulars	Hanumanahalli	Taruve
Population	187	736
Male	95	371
Female	93	365
Total families	25	75

Literacy:

Particulars	Hanumanahalli	Taruve
Population	187	736
Total literacy	56.3%	48.2%
Male	59.6%	53.4%
Female	53%	43.%
Above 10^{th} std	14.6%	4.5%

There is one Higher Primary School in each of the village. For higher education they have to go for Moodigere.

Weaker sections:

Hasalars (Harijans) and *Malekudiyas* are the weaker sections in the village. They are land less labourers and are socially deprived. Wage earning is the major occupation of *Hasalars*, it is 72% of their total income. *Malekidiyas* earn 38% of the total income from wage earning and 20% through agriculture.

Dependency on forests:

During 1950's there were no communication facilities. The villagers would depend on forests for agriculture to fulfill their needs of food, medicine, agricultural implements, pest control etc. Since there were no hospitals nearby, they would depend on traditional medicine men for curing of several diseases and the common ailments.But now, due to transport facilities, people have access to hospitals, due to which dependence on forests for medicinal plants have decreased. About Rs.94727 is obtained through selling of commercial NTFP in this region in ayear.

Occupation: Agriculture is the main occupation. Coffee is the commercial crop in Hanumanahalli village. Paddy, arecanut, cereals such as *uddu(lentils), cowpea,* coconut, cardamom, black pepper is other crop cultivated besides coffee. Coffee is also the major crop in Taruve village, but it does not have large plantations as in Hanumanahalli. Other crops cultivated are arecanut, paddy, coconut, cardamom, pepper, fruit plants, and vegetables. The main occupation of the minority communities – Muslims and Christians is trade (business) and service industry. The Muslims do not possess any land while the Christians are small landholders. Although the *Harijans* possess some land, their main source of income is through farm labour and NTFP collection.

In general, agriculture is the major occupation for the villagers, which accounts for 41% of the total income. About 18% of total income are obtained through wages and 2 % is from NTFP sale. Trading, service and some other occupations contribute 30% of income to the villagers. *Vokkaligas* and *Brahmins* are not involved in colleeting the commercial NTFP.

2.0 Forest Economy

In general, NTFP sale contributes only 2% of the total income to the villagers. However, this is because *Vokkaligas* and *Brahmins* have high proportion of income from agriculture. However, for other communities NTFP sale is an important source of income the *Malekudiyas who* earn Rs. 2,160 that accounts for 41% of their total income.

Role of forests in agriculture: -The villagers collect the forest products such as green leaves, medicines, consumptive, and commercial NTFPs for their household use. They use forest products for manure and controlling pests affecting paddy fields.

The following fibres are used in agriculture for tying and for fencing puropses.

Mundaraki beelu :- This climber is used to make baskets, used in agricultural operations. However, its availability has decreased due to over-exploitation. Also, plastic and senabu (Jute) fibres are easily available in the market that has replaced natural fibres. The man power required for collecting these natural fibres are more.

Hondige :- This climber is used as a fibre for fencing work and also in other agricultural practices. All communities used this fibre in the past, however, due to decreased availability and other alternatives, its use has decreased.

Kalli :- Fibre is extracted after soaking the leaves in water for a few days and used in agricultural practices. Its use has also decreased.

Kadupina beelu :- Still popular as a fibre for tying thatch, binding fences and in various other agricultural operations. *Halivaru, Bilirasa, Ajjalu, Ragadi, cane, baine* are other species, that are used for fibre.

Bio pesticides: Earlier, the mixture of *Kangalaka* and *Heddumbe*, was sprayed to control the leaf roller pest in paddy. A broom is prepared using *Vate* (*Ochlandra* spp) and some other branches of thorny plants. This broom is gently moved on the paddy to remove the

pests. Usually they follow two techniques to control the pests. Another method is, water from the paddy field is drained out for 2 – 3 days and afterwards plant is gently combed. In the mean time ants and other predators of these pests come to the field and prey on them. Thus by using predators the food chain the pests are controlled.

The decoction of *Kattinamaddu* and *Kainore soppu* is used to treat blast disease in paddy. Also the mixture *Chenduhoovina* rasa (juice) and *Karekai* as a bio pesticide to control the caterpillar. These practices were followed by all the farmers in the past. But now the upland type of paddy field is converted into coffee plantations, low land field is converted into either as coffee plantations or as areca gardens. Now only few farmers are cultivating the paddy field and traditional methods of controlling the diseases and pests have disappeared.

Besides, coffee planters spray numerous pesticides to the plants. This has resulted in imbalances of food chain in the nature.

Dependency of weaker sections on forest for NTFP: *Hasalaru, Malekudias* are considered as weaker sections of the society. They have very little agriculture land, hence their depend more on NTFP collection. These communities are collecting more than 60 products for the household consumption and for their agriculture use they use fiber, cattle feed, fuelwood, fodder, wild fruits, bio-pesticides, agriculture equipment etc. Each family is collecting more than 50 kilograms of Jeerksina kayi, to be used as tamarind substitute.

Honey, *Seege, Antuvala, cane* and *cane* articles, bamboo articles, bamboo articles, *Ichalu mats*, *Vaate goragu*, *Rampatre*, *Nelli*, *Vaatehuli,* Wild pepper, *Dalchinni, Vaatekayi Mundaga* and *Kedige* are the NTFP's collected for commercial purpose. Value addition and processing to NTFP's is done almost by this community.

General conditions of the village

State of the forest: Evergreen, semi-evergreen and moist deciduos forests are found in this region. The area had dense forest cover in the past which is now degraded.

The establishment of coffee plantations in forest area has been the main cause for the degradation of the forest along with commercial exploitation and encroachment. These

encroachments, mostly backed by politicians, are for the purpose of extending coffee plantations.

Destruction by plantations and encroachments: In Hanumanahalli village, huge coffee plantations were established at the expense of the forests as the conditions here were more favourable than in Taruve village. *Dalits* and *Badagis* who had small or no land, encroached on the forest to cultivate coffee. Encroachment of forest land is a serious problem in Hanumanahalli.

3. History of NTFP Collection

During 1930s the population was very less. Few families of *Hasalars, Badagi's, Vokkaligas* and *Brahmins* were the communities living in the village.

Agriculture was the main occupation for the villagers. Paddy, Coconut, Food crops and cardamom are the major commercial crops. Due to less population, a portion of the agriculture land was left uncultivated. Since the cultivated land was small the demand for the forest products to use for agriculture was limited. The minority communities, who came around 1970 , have encroached the forest land and concentrated on commercial aspects of forests. This resulted in degradation of the forest.

Some Ayurvedic Pharmacies and traditional medicine men from the different regions came here to collect the precious medicinal plants.

The present trend shows a decreasing reliance on forests for medicinal plants and an increasing reliance on allopathy. The Forest Department has given contract to extract *Dhoopa, Dalchini* bark and leaves, honey and *cane* from the forest.

Mushrooms :- *Koogina anabu* and *Moglu anabu* is available on the trees during monsoon. *Beru anabu, Ukkatti, Kukkadi, Handi, Hullu anabu* are found on the ground in the forest areas. *Dargu anabu* is available in the coffee and arecanut plantations. All the above-mentioned mushrooms are edible. Each household collects about 5-6 Kgs. of mushrooms on an average per year.

Jirksina mara :- Nut and leaves of *Jirkina mara* are used by the villagers for various purposes. Villagers especially collect the nut and make slices and dry it . It is used similarly as that of tumarinal. Almost all the Taruve families collect about 30-70 kgs *(per family)* of the nut every year. *Badagis,* Muslims and *Vokkaligas* also collect this nut;

but in smaller quantities. The leaves are used as pest repllent as well as to protect wooden planks from pests. The leaves are also used to manufacture a traditional raincoat known as *goragu* .

Bamboo shoot : Tender bamboo shoots supplement the food of all the communities. On an average, about 15-20 kgs. of bamboo shoots are collected per family per annum.

NTFPs used in making pickles: *Aramadlu, Nelli, Kouli*, mango (varieties like *katamavu, Hulimavu, Jeerigemavu, Gotamavu*), bamboo shoots (both *vaate* (*Ochlandra rheedi*) and *bidiru* (*Dendrocalamus strictus*)) etc., are used in pickle-making. About 50-200 mangoes or 1-2 kgs. of bamboo shoots and ½-2 kgs of other NTF products such as *Karjagi kayi*, are used in making pickles a nut produced from a climber that is another product used in making pickle.

Wild tubers : *Maragenasu, Addagenasu, Nurigenasu, Saligenasu* are some of the wild roots available in this region. These wild tubers are used for edible purposes either by boiling or as a substitute in cooking. Today these wild tubers are rarely available due to various reasons. And their use is also restricted to few families.

Honey, *Seege, Antuvala*, Cane articles, *Vaate huli, Nelli, Murugalu* and *Booradahatti*, are the products that have become commercial NTFP. After Commercialisation, demand for these products have increased. Cane articles and honey were sold in the Kottigehara, a trading centre. Villagers are using less quantity of honey for household consumption but they sell more honey. Availability of cane is reduced after commercialisation of the product.

4.0 Present Status of NTFP

Villagers in Taruve depend heavily on the forest for their daily requirements. NTFP is collected for household consumption, medicines, agricultural operations as well as for income generation. *Dalits* and *Badagi* are the major communities who collect NTFP in large quantities and others such as *Brahmins* and *Vokkaligas* collect NTFP for domestic consumption and agricultural purposes. Some Muslim families are involved in the collection and trade of commercial NTFP. The Christian community depend even less on NTFPs.

Dependence on consumptional NTFPs:

Dependence on consumptional NTFP has decreased over the years. In the past, villagers used more than 65 to 70 plants (leaves of the plant and climbers) for making dishes like *tambli*, *gojju* and in *sambar*. This number has now decreased to about 15-20 plant species and that too restricted to a few families. Vegetables are now purchased from the market . Dependence on medicinal plants is also decreasing. There are no experienced traditional medicine men in this region and belief in their practices has also disappeared. The women interviewed claim that in the olden days traditional medicine men could cure more than 150 diseases and knew more than 300 medicinal plants.

When we look into the community wise dependency on consumptional NTFP the *Brahmins* are using as much as 85 species for consumptional needs. In this edible NTFPs are 42 non-edible NTFPs medicinal 15 and another 16 NTFPs are collected for religious purpose. The non-edible NTFP's are those NTFP's which are used in agriculture. *Malekudiyas* are using maximum number of consumptional NTFP. They are using 66 NTFP's as consumptional NTFP in which edible is 23, Non-edible 15 and medicinal NTFP is 16 Muslims are found to be least dependent up on the consumption NTFP. They are using only 11 NTFP's for household requirements.

5.0 Market Value of NTFP Collected

Table No: 5.12c

Income from commercial NTFP in Moodigere cluster(1997-98)

Name of NTFP	Qty harvested	Unit	Income
Seege	1000	Kg	7500
Honey	250	Kg	16250
Geku hullu	25	No	250
Nelli	125	Kg	562.5
Vatehuli	75	Kg	3750
Murugalu	150	Kg	4050
Katumavu	2500	No	1750
Dhoopa	25	Kg	1125
Uppage	300	Kg	13500
Rampatre	300	Kg	31500
Wild pepper	150	Kg	11250
Antwal	500	Kg	3750

Uppage, Honey, *Seege*, *Rampatre* are purchased by LAMPS of Moodigere. Other NTFP are purchased locally.

Marketing channels:

Marketing is done through the LAMPS(Large Scale Adivasi Multi- Purpose Co operative Society). A branch office of LAMPS is situated in Moodigere town. They have been collecting and marketing major NTFP in the region. Kalasa and Moodigere forest range are covered under LAMPS. LAMPS gives royalty to the KFD and gets the permission for collection of NTFP. The royalty given by the LAMPS for last three consecutive periods are as follows.

Table No:5.12d

The royalty given by the LAMPS to KFD in Moodigere.

Period	Amount (Rs)
1993-95	11741.00
1995-97	53851.00
1997-99	53382.00

They purchased *Seege*, *Rampatre*, *Antuvala*, Honey and *Uppage* from two ranges, viz., Kalasa and Moodigere of Chikmagalur Forest Division. Besides, marketing of NTFP LAMPS has attempted small scale processing *Seege* powder.

Also they give advance to collectors towards helping them in the lean periods.

Hasalaru, *Medar*,*Malekudiya* are the major communities getting benefit from the LAMPS. Villagers, particularly tribals were happy about the services offered the LAMPS. But some of the non tribes were claiming that as only tribes are permitted to collect the NTFP they had no acess to collect the NTFP.

Kottigehara is the central village. Villagers sell some of NTFP to local traders. Such traders market these products to the travellers. NTFP like honey, cane baskets, medicinal plants, and wild fruits are sold to tourists.

Market for new prodcuts of NTFP:

Uppage rinds was used as tamarind substitute for years and as a constituent in fish curry. But due to high price for this product in recent years people harvest this for sale.

6.0 Harvesting of NTFPs

Several NTFPs have recently entered the market due to which its prices have also increased. This has led to competition among the collectors for the NTFPs. Traditional medicine men and some Ayurvedic Pharmacists have recruited special agents to collect medicinal plants. Some Ayurvedic pharmacists and traditional medicine men from the coastal region especially from Kundapur, Udupi and Mangalore have started collection of medicinal plants from this region. Medicinal herbs like *Shathavari* is over-exploited. Tourists who stop at Kottigehar have started to purchase several NTFPs especially honey and cane baskets. People started to collect *Maragaja* and *Buruga hatti* by lopping off the branches or even by cutting the entire tree. Villagers claim that some outsiders have also started to collect medicinal plants illegally.

Possibilities of sustainable harvesting: Many NTFPs are used domestically as well as for sale. There are very few NTFPs which are collected only for sale. Most of the NTFPs are used only for supplementing their diet. NTFPs mainly used for medicinal and agricultural purposes are for local consumption only.

7.0 Legal/Tenurial Issues

The forest is part of Reserved Forest.

Coffee plantations cover major portion of the village. NTFP like *Antwal, Katumanvu, Murugalu* are the commercial NTFP available.

8.0 Gender and NTFP Collection

The women are engaged in processing of almost all the NTFP. Only the women do the value addition to certain NTFP's like weaving mat from *Geku, Mundige, Kedige* and *Ichalu*. Collection, processing and cooking of almost all consumption NTFP is done by women. Men do the Collection of major commercial NTFP and women occasionally go with them. Decision making regarding NTFP marketing, using income from NTFP is done only by the men.

CASE STUDY

NTFP brings cash

Name- Parvati

Age- 49

Caste- *Hasalars (SC)*

Village- Kottigehara

Taluk- Mudigere

District- Chikmanglur

Description of the family- Parvati, her two sons, and a daughter are the members of the family. Daughter got married last year and presently Parvati and two sons are living in the house. The government gave them 5 cents of land in which they have built a small house and kitchen garden.. Further, they encroached the adjacent forest area, which is about one acre. In this land, they grow coffee, areca plants, coconut, and paddy. Besides they own three cattle and a small poultry farm.

Occupation- Farming, agriculture labour, NTFP collection and value addition to NTFP.

Farming- Family has one acre of agriculture land, which is an encroached forest. They claim that the land is not fertile, hence the yield is low. In the year1997-98, they earned an income of Rs 2,325-00 from agriculture.

Agriculture labour - Parvati's second son is a permanent laborer in the nearby farm. Occasionally he does work in his own farm and to collect NTFP. He is getting an income of about 11,500 rupees per year from agriculture labour. Besides, he gets some medical incentives and clothes as gifts.

NTFP collection- They are collecting the NTFP for household consumption as well as for sale Sons are involved in collecting the commercial NTFP where as Parvati is involved in collecting consumption NTFP. They have to travel a distance of 15 kilometers to collect the NTFP.

Table No: 5.12e

NTFP collected by a family in Moodigere cluster

Name of NTFP	Quantity collected (kg)	Quantity sold	Price/unit	Income
Honey	45	40	55	2,200
Seege	60	57	9	513
Antwal	18	15	10	150
Rampatre	5	5	60	300
Wild pepper	3	3	90	270
Vaatehuli	10	7	25	175
Canes	75	60	3	180
Shatavari	6	5	25	125
		Total		3913.00

Jeerksina huli, *Mango*, *Jack fruit*, *wild roots*, wild fruits, some medicinal plants, fibres are the major NTFPs collected for domestic consumption. They collect more than 60 kilograms of *Jeerksinahuli* to use as tamarind substitute.

Value addition to NTFP: They prepare cane articles and *Gorgu* from *Vaatebidiru*. In the year 97-98 they obtained Rs. 515-00 through value addition.

Earlier they were collecting some other commercial NTFPs like *Dhoopa*, *Dalchinni*, *Maragaja* and Wild Pepper. However, in recent years the availability of these products is reduced, hence they are unable to collect these items. Over harvesting of these spices has resulted in decreased availability of the produce.

Figure 5.34 Proportion of income from different sources among different communities in Moodigere cluster

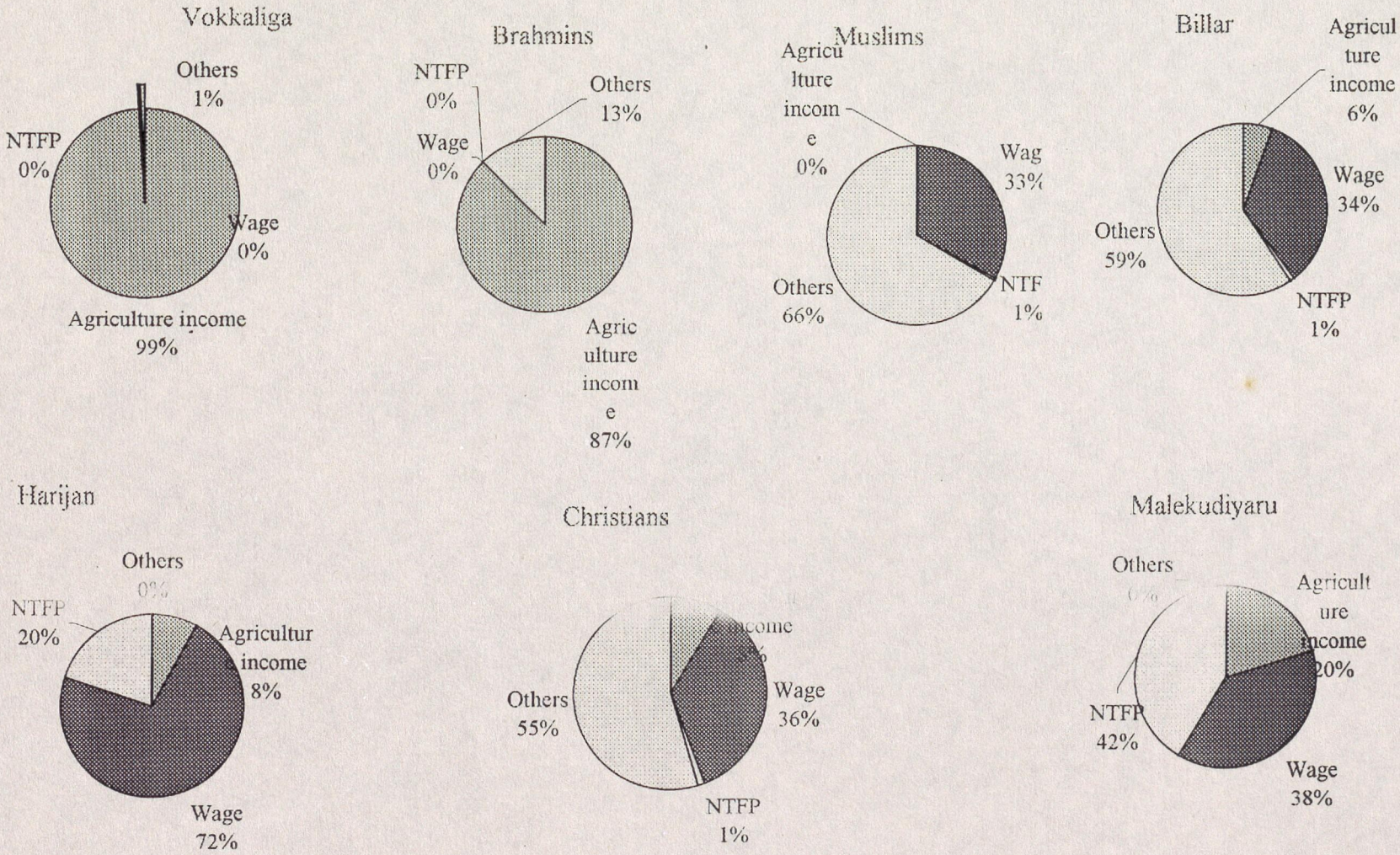
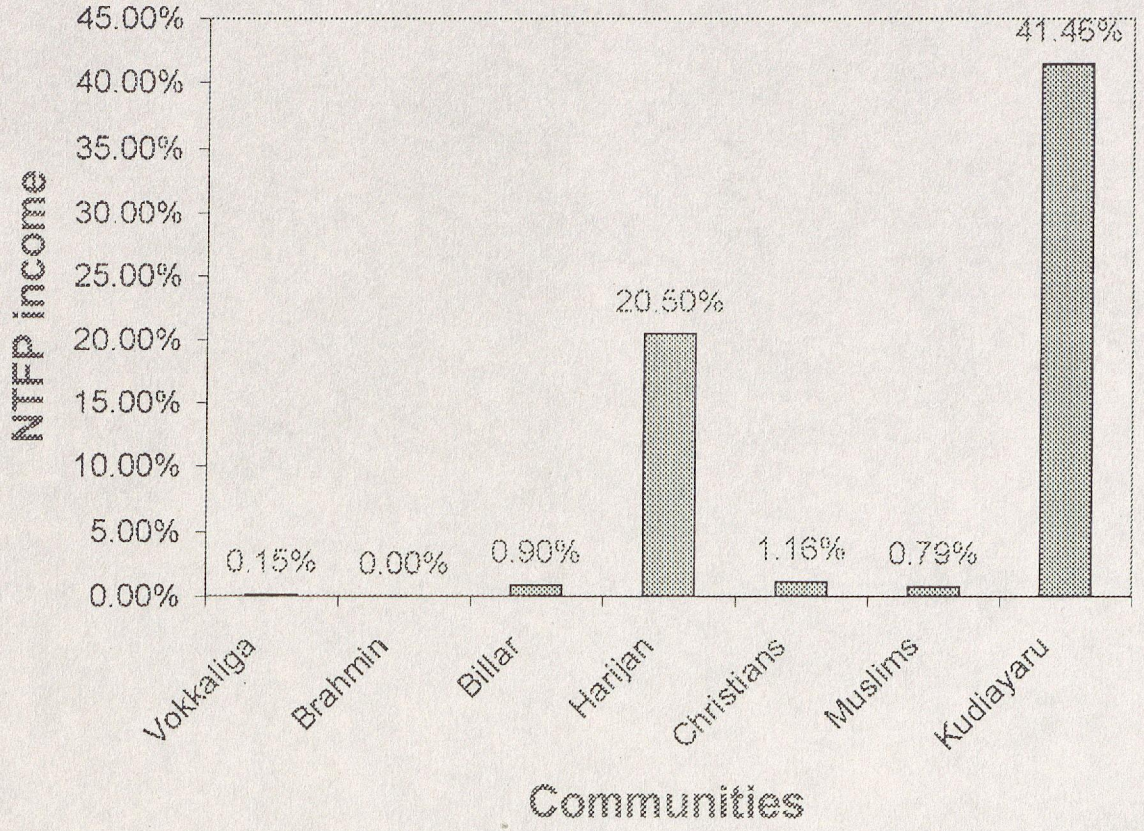


Figure 5.35 Contribution of NTFP to Total income in Moodigere cluster



13.0 SAMPAJE CLUSTER

1. Description of village and region:

The study villages are located at a distance of 28 kilometres from Madikeri the district headquarters. The village is situated, on the crest of the Western Ghats. Jedla, Lainkaje are the hamlets in Arekal village. Arecanut, coconut, paddy, cocoa, nutmeg, clove, pepper, cardamom and vanilla are the crops grown in this village. A large area is covered by the rubber plantations established by Government.

Table No –5.13a

Land use in Sampaje Cluster

Area in Acres	Arekal	Kallala
Total Geographic area	2787.00	1453.00
Forest area	2616.00	1023.00
Arable land	175.00	430.00

Kallala is a village situated at a distance of five kilometres from Sampaje, on Madikeri Mangalore road. *Brahmins, Muslims, Vokkaligas, Gollas*, and few *Malekudias* live in the village. Some families have migrated from the neighbouring Kerala.

The forest density in Kallala is less in the village than that of Arekal village. Arekal is situated on the hills, whereas the Kallala is situated on the in foothills of Western Ghats.

Socio-economic status

Description of communities:

Havyaks: Agriculture is the main occupation.

Malekudiyas: - (ST) NTFP collection; value addition to some of NTFPs like weaving baskets from cane, mat weaving and working as labour are the major occupation.

Vishwakarma: Carpenters, they have encroached forest, which ranges from one to two acres. They are also engaged in collection of NTFP.

Naik (Scheduled Tribes): NTFP collection, agriculture labour is the major occupation. They have one or two acres of encroached land in the forest.

Vokkaligas- Agriculture, agricultural labour and NTFP collection are the major occupations.

Table No –5.13b

Population and Literacy in Sampaje cluster:

Particulars	Arekal	Kallala
Total population	265	155
Male	141	121
Female	123	134
SC/ST Population	109	8

Literacy	Arekal	Kallala
Total literate	52 %,	51%
Male	59 %:	58%
Female	45 %,	44%
Above 10^{th} standard	12 %.	13%

Weaker sections:

Malekudiays: Malekudiyas have very little land. All thes families came to the village as the labourers. Later they occupied small patches of land in the forest for cultivation. Their main occupation is agriculture labour and collection of NTFP.

Dependency on forests:

The villagers use forest products, for one or the other needs ranging from vegetables to commercial NTFPs. *Malekudiyas* collect more than 14 types of commercial NTFP. The average income of these tribes from NTFP is Rs.12986.67 per year.

Occupation:

Agriculture is the main occupation. *Brahmin* families own 5 to 6 acres of arecanut plantations. All other communities own two acres of land which include paddy, arecanut, coconut, and small patches of barren lands.

Table No: 5.13c

Income from different sources of each caste in Sampaje cluster.

Caste	Agriculture	NTFP	Wage	Others	Total
Achari	13425.25	4056.25	2654.2	13245	33380.7
Brahmins	112900.26	200	0	40893.28	153993.5
Malekudiyas	7094.00	9594.05	8906.01	0	25594.07
Naik	6103.42	6913.28	8570.435	512.5	22099.64
Gollas	9865	8341	10254	300	25760
Vokkaligas	15558.17	7105.78	7803.51	0	30467.46
Muslims	0	1025.01	1526.32	25645.32	28196.65
Average	23563.73	4890.77	5673.496	11513.73	45641.72

Among *Malekudiyas* the contribution of NTFP income to the family income is 37.49 % a total income. Other communities *Naiks, Eravars, Vokkaliga* get an income of 39%, 29%, 23% respectively, from NTFP.

2.0 Forest Economy

Villagers opine that the income from the commercial NTFP of the village is about fifty thousands rupees. Other benefits like fuel wood, fodder, and comsumptional NTFP, not included.

Role forests in agriculture:

Fibers: fibers are used for tying the poles, fencing and in agricultural operations. They use about 14 types of fibers for their daily need.

Manure: Green and dry leaves, *Kangobbara* (topsoil in the natural forest) are collected and used as manure for the areca plantations and other agricultural crops.

Agriculture equipment: Earlier villagers used several agricultural equipments from the forests. However, due to change in the cropping pattern the dependency has changed. Earlier they used wooden plough, hoe, leveler, etc. but now they are using only wooden sticks to hold the spade, and saber handle.

Cattle feed: *Muchchira soppu* (green leaf), *Akkiballi* (climber) are used as fodder.

Dependency of weaker sections on forest for NTFP:

Handicrafts: handicrafts are mainly made by *Malekudiyas, Naik* and *Gollas*. They make baskets, storage bins, mats, cradle, brooms by using canes, bamboo, *Ichalu, Dadasalu, Vatebidiru* etc.

Commercial NTFPs: Seventeen types of NTFP are collected for commercial purpose. The *Malekudiyas* earn about 37% of their income from the collection and marketing of NTFP only. Whereas *Naiks* get 31% and *Gollas* about 29% from NTFP.

Consumption: They are using about 47 types of NTFP as food. Out of these about eight types of tubers are used for consumption. Others include leaves, bark, and fruits.

General conditions of the village

State of the forest: Rubber plantation: There is about hundred acres of rubber plantations in the village. The plantation is established after clearfelling the tropical forest. Earlier people were dependent on this patch of natural tropical forests, since it is situated very close to the village and had NTFP species. However, this was clearfelled by the KFD about thirty five years back.

Encroachment: *Malekudiya* families living the village was land less. They came to the village as labourers. They encroached the forest.

Logging: KFD collected timber from this region until 1995. Upto 1989 green felling (cutting of live trees) was being done. After that although the green felling is banned, cutting of green trees was continued in the name of collection of dead and fallen trees. While logging, roads were established in the interior forests.

Wild cardamom: There used to be hundreds of acres of natural forest in which cardamom was growing naturally. Most of the *Malekudiyas* were engaged in collecting this and this was one of the sources of livelihood.

However, nowadays, availability of wild cardamom is neglible. The reasons are, climatic change, decrease in natural tropical forests and thereby decrease in annual precipitation. The villagers also claim that average temperature has increased and fog, which used cover the region in older days, has also decreased. This resulted in reduction of cardamom species in the natural tropical forests.

3. History of NTFP collection:

Collection of NTFP started about forty years back in this region. Honey, *Rampatre*, Soap nuts, was collected. Articles made from cane are another important commercial product. Villagers, especially *Malekudiays* were engaged in this. Cane products are marketed

within and outside the village. Wild Cardamom and wild pepper were abundant and was collected and sold by the villagers. The Contractors collected the bark of *Kulirmavu* (*Machilus macrantha*). Government also gave contract to collect NTFP. These Contractors recruited their own agents to collect *Dhoopa.* Villages say that unscientific harvesting has caused extensive damage to both *Kulirmavu* and *Dhoopa* species.

Mantapuli (*Uppage*), *Vaatehuli*, *Dalchinni buds,* and *Seege* have been commercialised since last ten years. Wood oil extracted from the *Ennemara* (*Hardwickia pinnata)*, which grows in this region fetches high price. Oil is extracted from the tree by drilling hole to the stem. One tree gives as much as twenty litres of oil. The price of oil is Rs. 150 per litre (1998). However, the government banned the extraction of this oil. Nowadays these trees are almost on the verge of extinction in the natural forest.

Change in listing and commercialisation: *Vaatehuli, Seege,* Soapnut, *Mantapuli* (*Uppage*), Honey and canes are consumptional NTFP's that have become commercial NTFP.

4.0 Present Status of NTFP

NTFPs like *Ennemara* (oil tree, *Hardwickia pinnata*), *Kulirmavu*, Cane, and *Dalchinni* have almost disappeared from the natural tropical forests. The reason is over harvesting by the contractors and villagers.

Collection and weaving handicrafts from Cane was the one of the major occupation for *Malekudiyas*. However, as contractors collected the cane in unsustainable manner, by cutting unripe and immature cane, the availability of cane has decreased. *Malekudiyas* are unable to earn living from cane due to scarcity of the raw material.

Dependence on consumption NTFPs: Out of 147 NTFP listed in the cluster, 133 are collected for consumption purposes. However, nowadays the use of these NTFP for consumption is decreasing.

5.0 Market Value of NTFP Collected

Table No: 5.13d

Income from commercial NTFP in Sampaje cluster(1998)

Sl.No	Commercial NTFP's	Approx, Qty	Unit	Income(Rs)
1	*Cane*	2500	No.s	5000
2	*Dalchinni bark*	75	Kg	7525
3	*Dalchinni moggu*	175	Kg	11357
4	*Dhoopa*	20	Kg	1000
5	*Ennemara*	600	Liters	105000
6	*Honey*	300	Kg	15000
7	*Kaadu Rampatre*	150	Kg	13500
8	*Kulirmanv bark*	60	Kg	1500
9	*Mantapuli (Uppage)*	1500	Kg	91500
10	*Rampatre*	100	Kg	11520
11	*Rite* (soapnut)	75	Kg	600
12	*Sheegekayi*	200	Kg	1400
13	*Vaate huli*	75	Kg	3750
14	*Wildpepper*	80	Kg	6800

Marketing channels:

The collectors of NTFP have to sell their produce to LAMPS (Large scale Adivaasi Multipurpose Society). LAMPS has the legal right to collect NTFP. However, in practice the LAMPS appoints sub- contractors, who collect NTFPs. In most cases NTFP is sold illegally to agents in Sampaje.

Market for new prodcuts of NTFP:

Honey- Earlier honey was being used mainly for household consumption as sweet and as medicine. After commercialisation, the price of honey has increased. Therefore villagers started to sell honey, keeping a small quantity for domestic consumption.

Cane- The government auctioned the harvesting of cane to the Contractors. They exploited all the cane from the forest. The demand for cane articles from outsiders has increased. At present villagers are facing shortage of cane to meet their needs

Figure 5.37 Proportion of income from diferent sources among different communities in Sampaje cluster

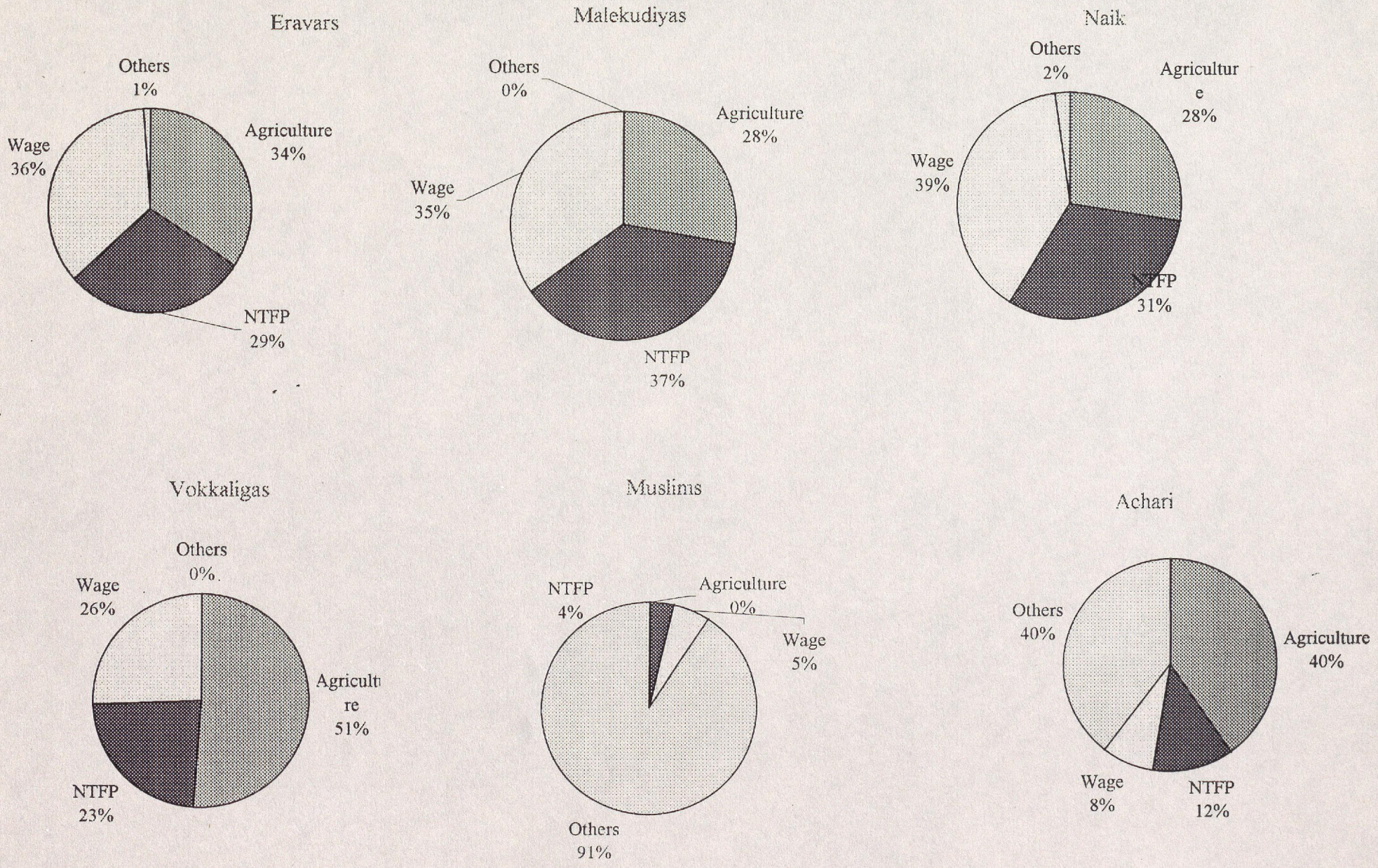


Figure 5.38 Contribution of NTFP to Total income in Sampaje cluster

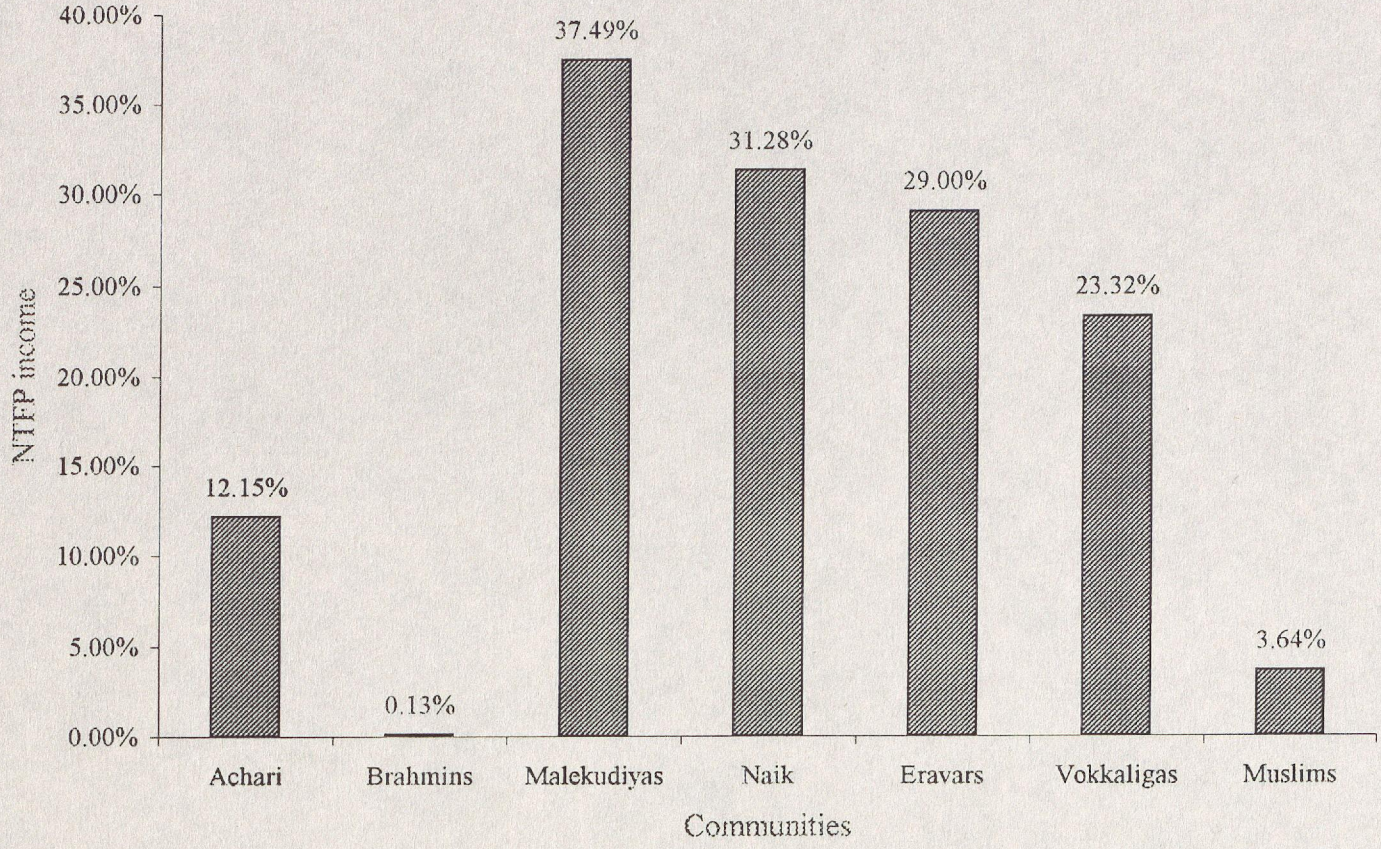
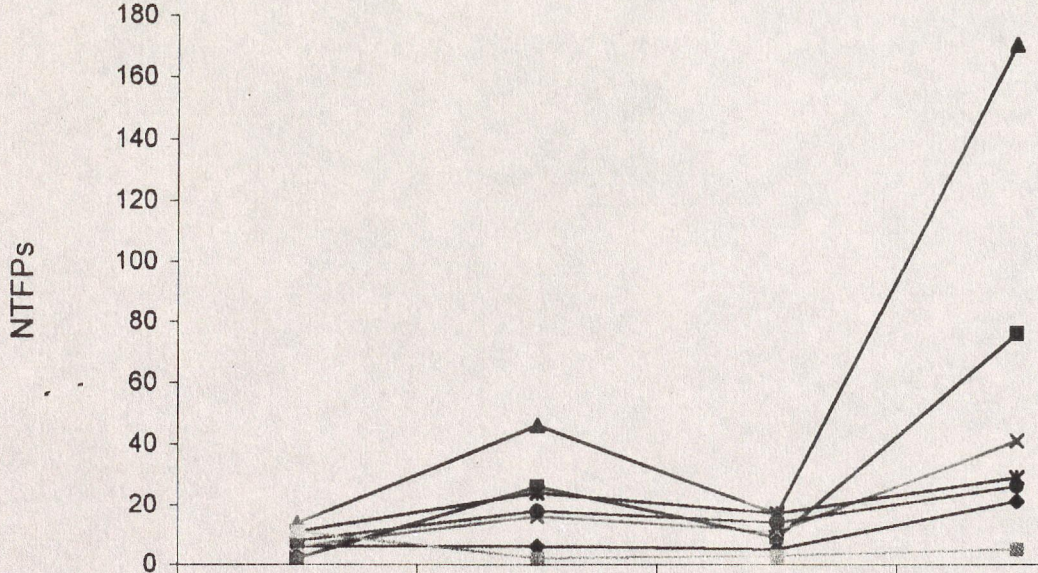


Figure 5.39 Type of NTFPs collected by different communities in Sampaje cluster



	Commercial	edible	Non edible	Medicinal
Achari	6	6	5	21
Brahmins	2	26	9	76
Malekudiyas	14	46	17	170
Naik	6	16	11	41
Eravars	11	24	17	29
Vokkaligas	8	18	14	26
Muslims	11	2	3	5

Communities

6.0 Harvesting of NTFPs

Ennemara (*Hardwickia pinnata*)- Earlier few villagers were using the oil extracted from this tree as varnish. But after commercialiazation more quanity of oil is extracted. Present price for one litre of this oil is Rs.150 to 200. More people are engaged in extracting the oil.The increased demand has lead to over exploitation, leading to destruction of the trees.

Possibilities of sustainable harvesting:

Sustainable harvesting technique is the immediate need. The government,with the help ofNGO's should give traning to the collectors so as to extract the oil in a sustainable manner.

7.0 Legal/Tenurial Issues

The forest is Reserved Forest. *Kumki* land is given to areca planters. *Kumki* is specially granted to spice growers. There are limited numbers of NTFP species, which grows in the *Kumki* land. The reserved forest surrounded by the village has more number of NTFP species. NTFPs are collected from this forest region only.

No specific tenurial system is operating in this region.

8.0 Gender Issues

Men make decession regarding expenditures and the income earned through the marketing of NTFP.

The consumption NTFPs are collected, processed and cooked by the women. They collect mushrooms, wild roots, tender leaves from several species, barks, fruits, nuts and flowers. Almost all these products are collected, processed and cooked by the women.

Women of *Malekudyia* and *Vokkaliga* prepare mats from *Ichalu* leaves and brooms of Dadasalu plant. These products are bartered in the village.

Cattle feed is prepared by women using *Muchira leaves, Akkiballi*.

14.0 SHRINGERI CLUSTER

1.0 Description of the Village and Region:

The village Kavadi is located at a distance of about six kilometers from Shringeri on Shringeri Koppa road. The village is situated on the banks of river Tunga.

Table No: 5.14a

Land use in Shringeri cluster.

Area in acres	Kavadi village	Markal village
Geographic area	1197.11	61390.16
Arable land	286.37	552.12
Forest area + Gomal	727	5552.74
Others	183.63	26.1

Paddy, Arecanut, Cardamom, Pepper, Coconut are the major crops grown in Kavadi. Coffee is grown mainly for domestic consumption. Some other food grains, vegetables, sugarcane are also grown.

Another village, Markal is situated at distance of about 8 kms away from Shringeri. It is situated at 650-meters height from mean sea level. The Narasimha Parvata religious place is located in the village, which is about 1150 meters height above MSL.

The Markal village is bigger than that of Kavadi both in population and in geographic area. It has thick forest cover where as in Kavadi the forest is degraded.

Paddy is the main crop both in Markal and Kavadi. *Brahmins, Vokkaligas, Maratha Naiks* have areca garden. They are growing arecanut, coconut, cardamom and pepper. Coffee is mainly grown for household consumption.

Socio-economic status

Gowdas –Major occupation of this *Gowda* community is farming, agriculture labour, and NTFP collection. They are experts in climbing trees especially to harvest arecanut, coconut and also honey (Rock bee).

Hasalar – (Scheduled Caste) Agriculture labour, NTFP collection are the major occupation. In Kavadi village, some of these communities are practicing sericulture. They

also do weaving mats, making several types of agriculture equipment from canes, *Vaatebidiru* and *Hedige beelu.*

Brahmins: Farming is the major occupation. At least one member of the family is in employment. One of them is a cook. They are collecting the NTFP mainly for their domestic consumption.

Badagi: Carpenters, some of them have agriculture land and they also collect NTFP.

Muslims: Trading is the major occupation. Some of them do have agriculture land. They collect the NTFPs, which have commercial or medicinal importance.

Table No: 5.14b

Population and Literacy in Shringeri cluster.

Particulars	Kavadi	Markal
Population	681	1514
Male	379	856
Female	302	658
Families	114	311

Literacy		
	Kavadi	Markal
Total	63%	60.1%
Male	68.3	66.48
Female	56.7	53.72
Above 10^{th} std	18%	12%

Weaker sections: *Hasalaru, Banajiga, Gowdlu,* and *Marathi Naik* are the weaker section of the society. They are socially deprived, economically poor. Many of them have no cultivable land.

Dependency on forests:

Since agriculture is the main occupation of the people, the dependency on forest products is high. Villagers collect variety of forest products as in other clusters. Fuel wood, fodder, manure, agriculture implements, etc are collected from the forest. Villagers collect about fifteen types of NTFP for commercial purpose. Out of these about six NTFP are used for consumption. Besides about 26 varieties of NTFP is collected for only agricultural purpose. About 47 types of NTFP are collected to be used as food.

Occupation:

Agriculture is the main occupation of people. They grow arecanut, paddy, coffee, coconut, spices, and some other food grains and vegetables. Recently new species are introduced like *Vanilla, Dalchinni,* Nutmeg, and Cocoa.

Agricultural labour is the another major occupation for villagers, particularly for weaker sections.

Out of the total income earned, agriculture contributes 37% and 34% through trading and other work, 10% is obtained through wage earning. Proportion of income from NTFP is 29% to the total income.

The commercialisation of NTFP has resulted in increased demand and over harvesting of NTFPs.

2.0 Forest Economy

Relation with village/regional settings:

Villagers are heavily dependent on the forest. Apart from the agriculture requirements, villagers collect more than 40 products to be used as food and 50 products for medicinal use. About 15 types of wild fruits, 10 types of products for other needs like extraction of oil, to take cotton and nearly 100 products are collected for religious purposes. Many communities eat meat of wild boar, fish, Indian hare, Giant squirrel, Jungle cat etc.

Contribution of NTFP income to the total income is 29% in Shringeri cluster.

Marathi Naiks are getting 42.5%(Rs 11796) of their total income from NTFP. *Hasalars* are getting (Rs. 6713) by NTFP sale, which is 42.53% of their total income. For *Gowdlu* community proportion of NTFP income is 29.7%, this is Rs 7835 per year. For the *Kumbar* community NTFP provides 41.21% of income that is Rs 6458.65 per year.

Role of forests in agriculture

Manure – Green, dry leaves, and fodders are collected from the forest to prepare manure by mixing it with cow dung and urine. Green leaves are collected by all the farmers, mainly from the trees like *Hudachappu, Bhogi, Kindlari, Neralu, Salle, Kunnerlu, and Nelli*. Dry leaves are collected from forest.

Fiber – Several types of fiber are prepared from climbers and from the bark of the trees/plant.

Hedege beelu (climber) – Used to make baskets of various sizes to store/transport agriculture products and also to transport manure. *Hasalaru* make these baskets from the climber.

Bili beelu (climber) – For tying purpose, and also to weave the mats.

Kallu balli – For tying purpose and for fencing work.

Nela happana balli – Mainly used for fencing purpose.

Hodike beelu – For tying and fencing work.

Agachappan balli–Tying poles in building huts, for tying purpose.

Kavalu – To bind green leaves, to tie cattle.

Basari – To tie cattle, binding purpose.

Canes – For various agriculture purposes, fencing, tying works.

Baine – For fencing work.

Agriculture equipment:

In the past plough was made out of *Bhogi*, *Mango* and from *Jack* tree. But today iron ploughs have replaced the wooden ploughs.

Leveller – Leveller is prepared mainly from *Baine* tree.

Eesu (A stick in between plough) is prepared by Baine tree

Noga – It is prepared by *Shivanne* or from *Jack* tree and also from the root of the Jack tree.

Mats are prepared from cane, *Vaate* bidiru, *Ichalu*, *Mundaga* and from *Biliballi*. They are used for storing food grains, for processing of agriculture products.

Bio-Pesticide – *Heddumbe* and *Mukkadaka* leaves are used to control the leaf roller pest in paddy. *Vate* leaves and *Mukkadaka* with thorny brooms are also used to treat the leaf roller pest in paddy. A broom is prepared by above three species and it is gently brushed on the paddy plants to control the leaf roller pest.

Pest-repellant – Mixture of leaves of *Naga sampige* and *Lakki* are used as pest repellant especially to preserve paddy and other food grains.

Cattle feed is prepared using *Kanagala* and *Atti* leaves, and Fodder. This is prepared locally is known as '*Muruga*'. Several other climbers are also directly fed to the cattle.

Medicine to cure cattle diseases: *Shivanne, GaddeTumbe, Lakki, Chagate soppu* etc are used to treat several cattle diseases. There are three traditional medicine men in *Markal* village and two in Kavadi village who give traditional medicine for cattle.

Dependency of weaker sections on forest for NTFP:

The weaker section communities are mainly dependent on forest products for their livelihood. They are landless and socially deprived for centuries. The employment opportunity is limited. NTFPs are also used as food. Tender leaves/shoots of more than 15 plants are used in preparing the food items like *Hasule, Chutney* and *Sambar*. Three types of wild roots are used as food. The cowherds and children eat more than 15 variety of fruits available in the forest.

Mushrooms: *Kallu Anabe, Heggalu Anabe, Korle Anabe, Gobbara Anabe, Mara Anabe, Hullu Anabe, Akki Anaba* are the varieties of mushroom collected for consumption.

Deerksana huli is another NTFP specifically collected to use as a tamarind substitute. They store and preserved. Occasionally, hunting wild animals like Indian Giant Squirrel, Indian Porcupine, Indian Hare, Wild Boar, Fish and Crabs are common.

The weaker sections give medicine for both human beings and cattle. They use 50 or more medicinal plants to treat the diseases.

Hedige beelu: The women of the weaker section prepare baskets form this climber to be sold it within the village. *Goragu* is prepared from *Vaatebidiru* and from the leaves of *Deerksana* tree to use it as a raincoat in the monsoon. Goragu is especially prepared by the women. Mats from Cane, Bamboo, *Mundige, Bilibeelu* are prepared by the women and used for household activities and for sale. Cane baskets of various sizes are prepared, used and sold.

General conditions of the village

State of the forest:

Kavadi village: Increase in the population has forced the villagers to encroach the forest. Logging, fuelwood collection and several other pressures have resulted in degradation of the forest.

Markal village: Some villagers opined that illegal felling and smuggling of the trees from the forest is the major cause for degradation of the forest.

3.0 History of NTFP collection:

Commercial collection of NTFP started about 30 years back, before that a limited species of medicinal plants, Wild Pepper and Honey was collected for commercial purpose, in very small quantities. Commercial collection started with the auctioning of *Baine (Caryota urens)* tree to prepare *Kallu* (wine). The Karnataka Forest Department has auctioned this to contractors for 10-12 years. The *Dalchinni* tree is auctioned to the contractors. The general method of collecting Dalchinni leaves is by cutting the branches of trees. Thus has reduced its availability. Apart from the contractors, a small-scale industry is established in Shringeri to extract oil from *Dalchinni* leaves. The industry has recruited their own agents to collect the Dalchinni leaves in the surrounding forest region. The Ayurvedic drug companies do the collection without any permission. There is a small drug extraction pharmacy in Shringeri.

Change in listing and commercialisation:

Uppage, Honey, Cane, Vaatehuli, Suruligadde, Vaate (*Ochlandra rheedi*) *Bamboo*, Medicinal plants, *Seege, Antuvala, Dhoopa*, Baskets woven by *Hedigehalli, Brooms* of *Dadasalu* were the consumption NTFPs that have now become commercial NTFP. The main reason for this change is increased demand for these products. Earlier there was no demand for these products. Entry of contractors, subagents, Ayurvedic pharmacies the agents for collecting and marketing medicinal plants, LAMPS in Koppa are the reasons to change in listing and commercialisation.

4.0 Present Status of NTFP

Use of consumption NTFP has decreased due to the vegetables available in the market, allopathic medicines, modern agriculture equipment like iron-ploughs, plastic ropes, threads, ropes made out of choir have lowered the dependency on forest products.

Continuos use of some NTFPs and commercialization of NTFPs has led to over exploitation.

Dependence on consumptional NTFPs:

Out of 115 NTFPs listed during PRA in this cluster, only four NTFPs are collected for sale, 12 NTFPs both for sale and for household consumption all other 99 NTFPs are collected only for consumptive purpose.

Mushrooms: Villagers identify and eat nine varieties of mushrooms available in the forest.

Following are the different mushrooms as collected in the monsoon.

Mara anabu: Only one mushroom is found on one tree, quite large.

Bhogi anabu: Found on the ground under Bhogi trees. This kind of Anabu is available in large quantity. Each household except Brahmins do collect 4 to 5 cane baskets (60 to 70 kgs) of *Bhogi Anabu* in a year.

Halla anabu: The row of mushroom is found in the forest during monsoon some times for a kilometer long. Non-Brahmins collect 2 to 3 kgs of this type of mushroom

Akki anabu: It is grayish black in color, another white in color.

Gobbara anabu: Found in the heap of manure or rotten leaves. The villagers do not like this mushroom but few families eat this variety.

Koole anabu: Outer skin is very thick, this outer cover has to be removed while cooking. It looks like a cricket ball.

Kallu anabu: It looks like a small ball (Goli) in shape. Rarely found in this region.

Heggalu anabu: People believe that this mushroom grows due to thunder in the sky. Size is very big. 50-60 kgs of mushroom is available at specific place on some occasions.

Hullu anabu: Grows of paddy field and on *Hutta (*Anthill)

Brahmins use 86 NTFPs consumption, in which 41 is medicinal and 31 is edible.

Edigas use 70 spices for consumption in that 35 are non edible NTFP's. Christians, *Devadigas* and *Kumbars* use only 40 species as consumption NTFP.

5.0 Market Value of NTFP Collected

Table No:5.14c

Income from NTFP collected in Shringeri cluster (1997-98)

SNo.	Name of NTFP	Quantity collected/year (Kgs)	Price/Unit	Totalrevenue (Rs)
1	*Muruga(Uppage)*	450	65	29250
2	*Ramapatre*	175	95	16625
3	*Dhoopa*	5	35	175
4	*Vaate huli*	300	45	13500
5	*Honey*(4 types)	1200	55	66000
6	*Canes*	1000(nos)	7	7000
7	*Dadasalu*(broom)	75(no)	5	375
8	*Hedige balli*	75 butti	23	1725
9	*Gulamavu bark*	50	25	1250
10	*Dalchinni leaves*	7500	1.5	11250
11	*Dindu mavu*(mango)	4000(no)	100/80	3200
12	*Honne bark*	60	15	900
13	*Bamboo poles*	150(no)	10	1500
14	*Seege*	200	8	1600
15	*Suruligadde*	20	50	1000
16	*Wild pepper*	175	100	17500

Marketing channels:

LAMPS is operating in the region. It has given sub contract to agents to collect NTFP. Illegal traders are also involved in NTFP collection. There are some industries and Ayurvedic pharmacies in Shringeri. They collect medicinal plants, roots, leaves etc through their agents. However, there is no legal permission to collect these products from the forest.

Market for new prodcuts of NTFP

Mango: *Dindemavu, Hulimavu, Edadindu mavu, Ashada mavu*, are the varieties of mango found in the forest. *Edadhindu, Ashada*, and *Hulimanu* are used as fruits. Unripe mango is stored to be used it as a vegetable throughout the year. It is immersed it in salt water. *Dindumavu* is the used for making pickle. Recently outsiders have developed taste and it is estimated that more than 20, 000 mangoes are sold to outsiders. (Price was Rs 50 to 100 per 100 mango in 1998-99).

Impact on the local consumption: Earlier each household was able to get the required quantity of mango in a year. After commercialisation, only few people in the village are able to get the raw mango.

Baine (*Caryota urens*): The tree is used in making several agriculture implements. Due to overharvesting this tree is on the verge of extinction. It has affected the farmers adversely.

Cane: Baskets made from cane. At present the raw cane itself is being collected and sold to urban areas from this region. Whatever the quantity available in the forest is collected from the forest, many times, even the young cane are harvested leading to destruction of the resource.

Impact on local consumption: Farmers are unable to collect cane to fulfil their agricultural needs. They have to purchase the products from the market.

Honey: After commercialization of honey, several households in afford to purchase honey.

6.0 Harvesting of NTFPs

Pressures and destruction:

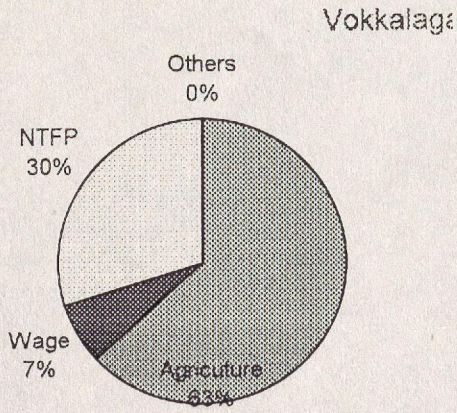
With commercialisation of NTFP, harvesting techniques have changed. People started to harvest maximum quantity in minimum time due to the competition among the collectors. As the price of NTFP increased number of collectors have also increased, and the cutting of branches of trees, is common.

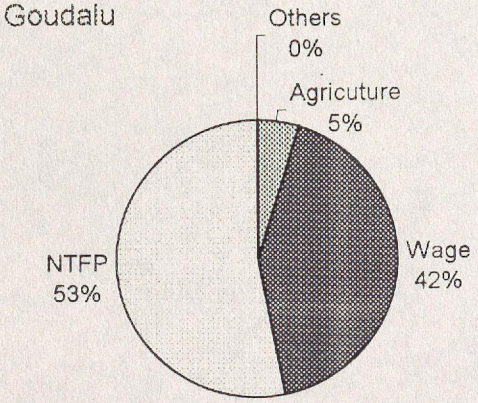
Destruction of hollows is being done while harvesting the honey from the *Apis cerena species*. Immature harvesting is common in case of honey extraction. All these have resulted in decrease in the availability of these products and degradation of the forest.

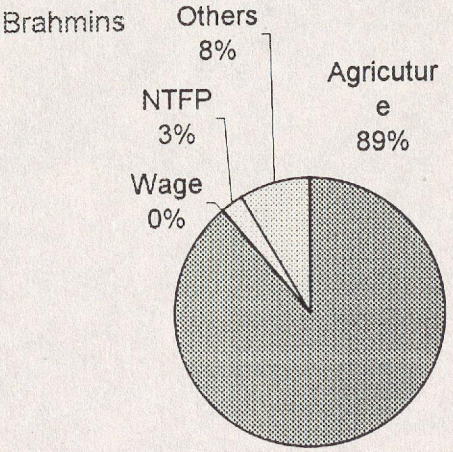
Possibilities of sustainable harvesting:

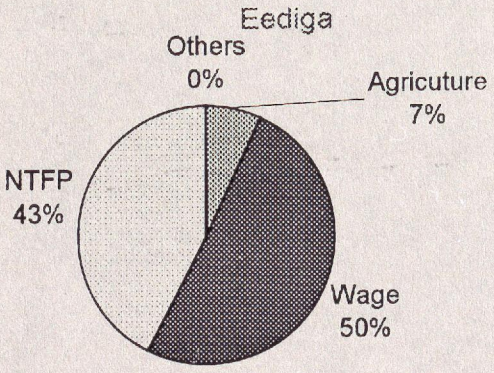
Sustainable harvesting is possible with all NTFP, which are not properly harvested at present. *Rampatre* can be collected only when it becomes ripe and falls on the ground. In the same way, *Uppage* can be collected only when the fruit falls down on the floor. However, crude method is followed in harvesting the *Dhoopa*. The stem of the tree is dug destructively to obtain the resin. In the course the tree dies after continuous extraction.

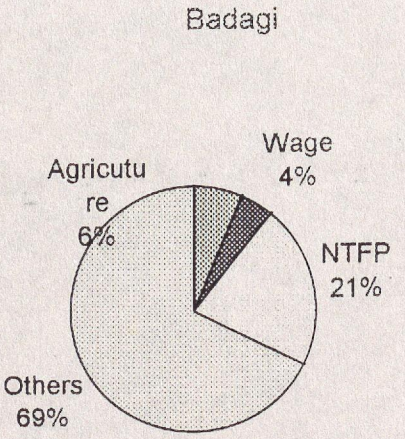
Figure 5.40 (a) Proportion of NTFP income from different sources in Shringeri Cluster
Part-1











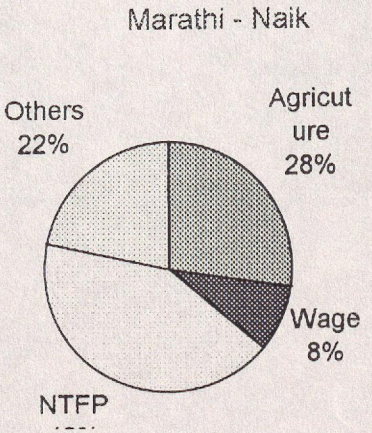


Figure 5.40 (b) Proportion of NTFP income from different sources among different communities in Shringeri Cluster

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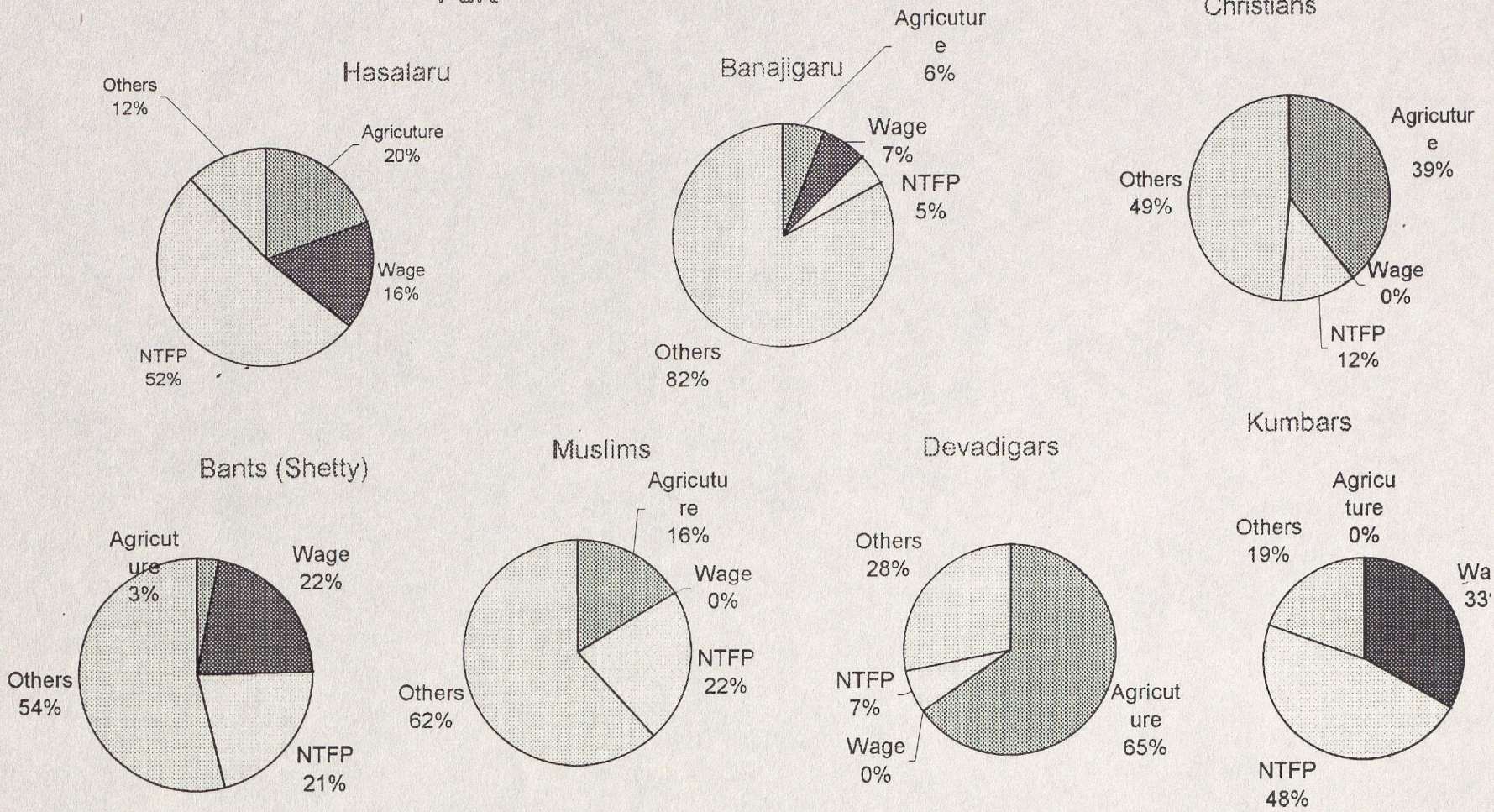
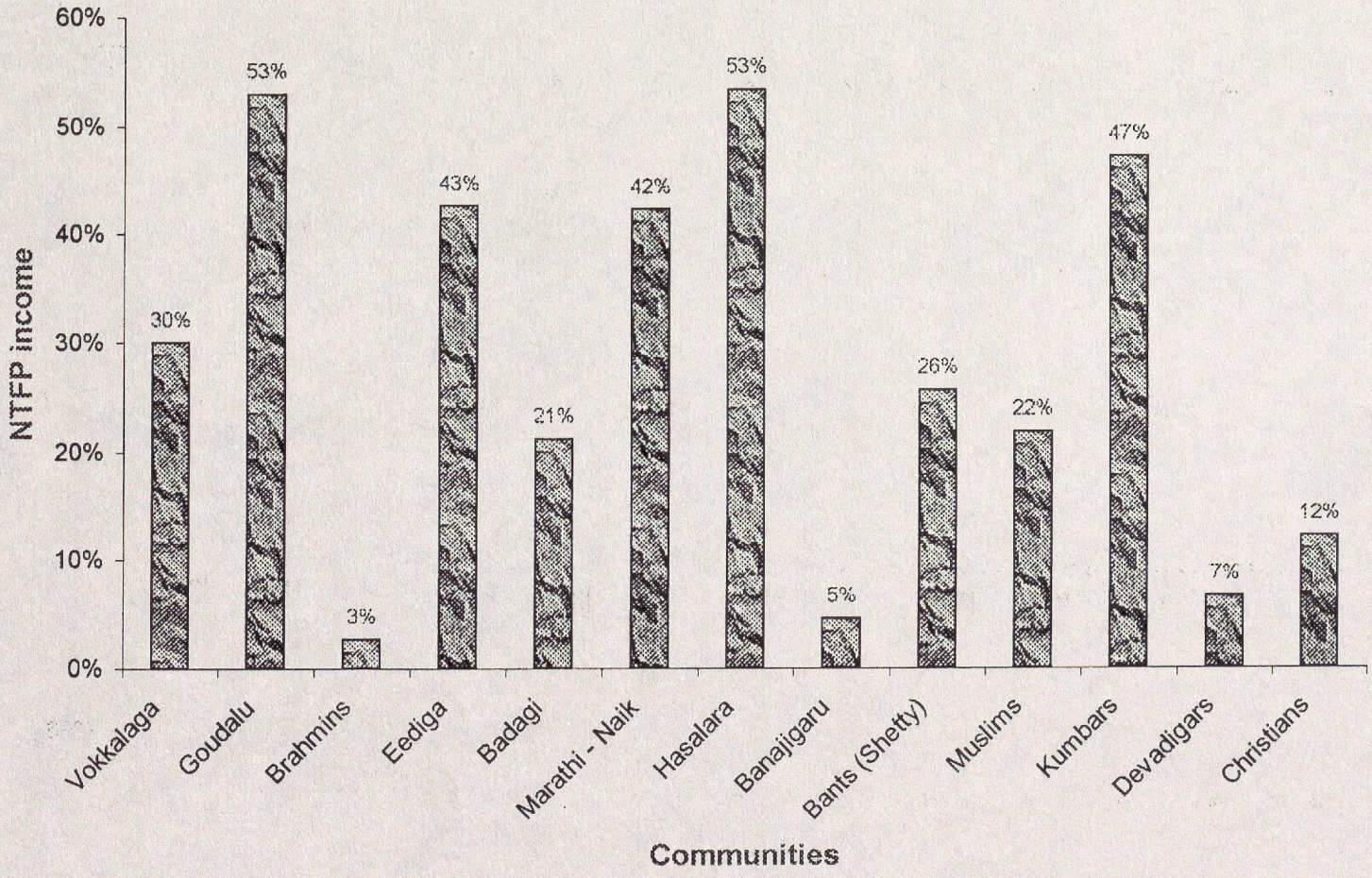


Figure 5.41 Contribution of NTFP income to the total income in Shringeri Cluster



7.0 Legal/Tenurial Issues

Kudremukh National Park was notified in 1987. The forest in the Markal village comes under this National Park. Legally people cannot collect NTFP from National Park. Nevertheless, the rules and regulations of National Park are not applied strictly.

8.0 Gender Issues

Only the women do collection and processing of consumptive NTFP. The collection of of mushrooms, wild roots, tender leave / shoots of plants are being done by the women of weaker sections and other castes.

The men generally do harvesting of commercial NTFP. Climbing the trees is done by the men whereas the women go along with men to pick the fallen fruits etc on the ground.

CHAPTER 6

GOVERNMENT POLICIES AND LAWS RELATED TO NTFP

There is no definite policy on NTFP, though the Government of India has briefly addressed this issue in its National Forest Policy of 1988 (NFP), which the following says on minor forest produce[1]:

"Minor forest produce provides sustenance to tribal population and to other communities residing in and around the forests. Such produce should be protected, improved and their production enhanced with due regard to generation of employment and income."

With regards to rights and concession, the NFP states that since the life of tribals and other poor living within and near forests, revolves around forests, their rights and concessions should be fully protected and that their domestic requirements of fuelwood, fodder, minor forest produce and construction timber should be the first charge on forest produce. It has also stressed that similar considerations should be given to scheduled castes and other poor living near forests after determining the carrying capacity of the forest areas concerned.

While addressing the issue of safeguarding the customary rights of tribals, the NFP suggests that the forestry programmes should focus on the following:

"One of the major causes of degradation of forest is illegal cutting and removal by contractors and their labour. In order to put an end to this practice, contractors should be replaced by institutions such as tribal co-operatives, labour co-operatives, government corporations, etc.

Protection, regeneration and optimum collection of minor forest produce along with institutional arrangements for the marketing of such produce."

This is the outline for NTFP policy at the national level. The respective State Governments are supposed to evolve their own policies and laws based on this principle.

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[1] WPSI & Nataraj, 1998, Handbok of Environment, Forest & Wildlife Protection Laws in India, Wildlife Protection Society of India and Nataraj Publishers, Dehradun, 1998.

NTFP Policy in Karnataka

The picture is the same in the state as well. There is no policy on NTFP in the state nor laws that have direct consequence on NTFP - its collection, processing and marketing. Several legal documents have some rules regarding the extraction of certain NTFP such as The Karnataka Forest Manual, The Karnataka Forest Act, 1963 and The Karnataka Forest Rules, 1969. *Karvi (Strobilanthus callosus)* are allowed to be extracted by the inhabitants of forest villages for agricultural purposes from all open forests, that extracted for non-agricultural purposes invites a nominal fee. Barren *sago* and other palms commonly used for watercourses and other agricultural purposes, and creepers also used for agricultural purposes (within the period of 1st November to 31st May) are allowed to be extracted from Reserved Forests with the prior permission of the Round (Section) Officer. Canes and all kinds of grass used for making baskets, chatais, brooms etc., are allowed to be extracted free of cost for bona fide domestic use but not for sale or bartered.

The Karnataka Forest Manual, which lays down the rules for the Karnataka Forest Department officials to follow, also states the privileges given to *'betta'* land owners. Betta lands are forest lands that have been given by the British administration to the villagers for the purposes of betelnut and spice cultivation. Removal of any kind of forest produce except certain tree species without causing irreparable damage to the plants is one of the privilege included among them.

In the Karnataka Forest Rules, 1969, cutting and removal of tender *ichalu* leaves (leaves of *Phoenix sylvestris, Borassus flabelliformis and Caryota urens)* are prohibited as well as from trees marked for the purpose of toddy revenue. Certain forest produce such as *hunse, hippe, seege,* coconut, *mavu, nerale, halasu, jali, byala, honge* leaves and seeds are excluded from sale except in areas where sales are conducted by the Forest Department.

The Panchayats (Extension to Scheduled Areas) Act, came into force on 24.12.1997, which confers among other things ownership rights of MFP to the Tribal Panchayats. Conferring ownership rights to Tribal Panchayats was made on the recommendation of

the Ministry of Welfare. This right is not extended to other Gram Sabhas/Panchayats where considerable tribal populations could be present but are not included under the Schedule V areas. State forest departments were required to amend their laws conferring ownership rights of NTFP to the tribals. Several states have made the required changes in their state forest acts. There is a provision in the PESA that if the required changes are not made by the states before the act comes into force. the Central Act prevails. The Ministry of Environment and Forests (MoEF), in turn, constituted a committee on 21.10.1997 to examine the implications of conferring ownership rights to tribal Panchayats/Gram Sabhas. The committee in its report dated 22.1.1998 states that only *usufructory rights* are conferred, not only to Scheduled Areas but also to other Gram Panchayats excluding those in protected areas. However, even if the MoEF decides to implement the recommendations put forward by the committee, this does not hold good in the court of law, i.e., if a tribal goes to court challenging the MoEF committee's recommendations, his right to ownership of the NTFP will be upheld as it is a constitutional right. It must be kept in mind though that all these controversies are unclear and the situation at the ground level remains unchanged although the Ministry of Rural Areas & Employment gave a suggestion that the MoEF direct state forest departments to put up notice boards at every concerned Panchayat proclaiming the above changes in law.

Suggestions and recommendations by the various government agencies

A committee was constituted by the MoEF on 21.10.1997 to examine implications of conferring ownership rights on tribals. In their report, the Committe has in turn gone backwards and redefined ownership as usufructory rights and states the reason that conferring ownership rights may allow the Gram Sabhas to even undertake destructive harvesting (MoEF, 1998)[2]. They suggest that to improve the economic condition of the poor forest dwellers, they should enjoy full usufructory rights and all the net revenue there from should be their property. This is confusing since ***usufructory rights*** would allow the tribals to consume the non-wood forest produce only for their subsistence and not for commercial purpose. However, the Committee talks about net revenue earnings on the sale of forest produce which could then be assumed that the tribals own the

[2] **MoEF, 1998, Report of the Expert Committee on Conferring Ownership Rightd of MFPs on Panchayats/Gramsabhas, Ministry of Environment & Forests, New Delhi, 1998.**

produce and would then be not required to pay royalty, taxes etc., to the Forest Department. The Committee then further states that ownership rights should be treated as *usufructory rights* not only in the Gram Sabhas of the Scheduled Areas but also in the entire country except those in the protected areas. They do not suggest any alternative for the forest dwellers in the protected areas. With reference to market institutions, the Committee recommends that the present arrangement of corporations/federations carrying out the trade of NTFP should continue as it is and that they should involve only Gram Sabhas/Joint Forest Management agencies in this activity.

It is interesting to note that in a letter to the Secretary, MoEF, dated 24th October 1997, the Secretary, Ministry of Rural Areas and Employment has come out with very interesting observations and suggestions[3]. Some of them are as follows:

1. Amending the Indian Forest Act to include twigs, branches and all non-wood forest products including bamboo under MFP; (NTFP).

2. Ownership of MFPs to be conferred on Panchayats and Gram Sabhas, whether these are located in non-forest lands or on forest lands.

3. Forest Department to put up notice boards throughout the Schedule V areas stating that ownership of MFPs has now been transferred to the Panchayats and Gram Sabhas. This should be combined with officers holding regular meetings with gram Sabhas and Panchayats and educating them about how to regulate over-exploitation and to scientifically manage MFPs.

4. A drastic overhauling of the policy frame wherein a state monopoly was considered necessary to counteract severe market imperfections is necessary.

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[3] Letter D.O.No.N-11011/14/97-PR dated 24.10.97 from Secretary, Ministry of Rural Areas and Employment to Secretary, Ministry of Environment & Forests.

Freeing the market of unnecessary controls and involving women's groups, VFCs (Village Forest Protection Committees) and NGOs in addition to government organizations, in marketing of MFPs.

The situation at the State level is very fluid, as there is no clear-cut policy that had been formulated by the State Government.

The Karnataka Forest Department more specifically, in Kanara Circle, Sirsi has brought out a paper - *NTFP Management Strategies* (Shivanagowda *et al,* undated) which has made some pertinent recommendations, although they have chosen to ignore the serious ground realities. Some of these are:

The main stakeholders of NTFP management are NTFP collectors, contractors, agents, and biodiversity. The main strategy is to improve incentives liberally for local participation in protection and management of the resource thereby improving their livelihoods and biodiversity conservation.

Policy changes required would include revamping the present royalty and tax system. A royalty rate of 5% of sales (or 12.5% of produce) although this could vary from product to product. Other options that suggested were; a percentage of profit or a fixed rate as royalty or no royalty at all to be levied. The paper also suggested investigating the possibilities of exemption from sales taxes, Forest Development tax, and Income Taxe for NTFP societies.

Benefit sharing and rates for royalty and taxes should be set following careful economic analysis of all final sale revenues from NTFP.

Several options for institutional arrangements were also suggested, such as, formation of societies with its own bye-laws and district registration, cooperative societies such as *Siddi* society, LAMPS, agricultural co-operatives etc., VFC (Village Forest Committee) or a Federation of VFCs and Self Help Groups (SHGs) or a cluster of SHGs. It was also proposed that the NTFP collectors sell their products directly to the NTFP society that may either sell them directly to the market or to the legal contractors.

Present ground realities

From contractors to end product - *mafia* rule in Western Ghats

Over the years there is severe competition among the NTFP contractors to have monopoly control over certain NTFP produce. This has resulted in the birth of NTFP *mafia* in the Western Ghats. These *mafia* groups have entrenched themselves deeply in the NTFP trade. They have many contractors under their control and distribute the forest areas to these contractors. A protective 'ring' is formed by different contractors in the region that takes care that the price of NTFP given to the collectors are kept low.

Monopoly holds over NTFP: Mafia dominates the market and they exploit the collectors by giving low rates. They are least interested in conserving NTFP resources on the other hand it accelerates the process of overexploitation of NTFP resources and in certain case forcing a species on the verge of extinction.

This *mafia* has control over one or several NTFPs. They also deal with many NTFPs that are banned from collection. Their storage godowns are huge and varied, located in different regions. The public is not aware of the presence of the *mafia*. During the course of our study, we came across some of the *mafia* leaders. One is based in Kumta on the West Coast, the second is based in Sirsi and the third is based in Talguppa in Shimoga district. Each *mafia* leader stocks numerous NTFP spices. These *mafia* leaders have the right kind of political and official linkages. This helps them to bypass the law. It is alleged that many forest officials are on their regular pay roll and they finance the election campaigns of top political leaders in the state. Thus, they have economic and political clout within the ruling elite.

They are the ones who supply NTFP to the factories or wholesale dealers. Their clout gives them an enormous advantage over other not so powerful competitors. The profits involved are astounding when compared to the pittance that is given to the collector. Hence the biggest question is whether the *mafia* will tolerate or permit any changes in the NTFP policy and marketing system that would eventually harm their interests. Several attempts by NGOs to initiate co-operatives of NTFP collectors to procure the right price have turned futile due to the intervention of the *mafia*.

CHAPTER 7

ECOLOGICAL ASPECTS OF NTFP HARVESTING:

Over the decade's importance of forests are considered from the administrators' view or broader environmental view. However, the views of the people living inside the forests are underestimated. As discussed in previous sections, NTFPs are the major links between forests and forests dependent communities. This can be used effectively as a key tool for conservation of remaining tropical forests. This can be done by insuring the interests of the people living in the region and involving them in conservation process.

However, in recent years, forests have been treated as an important source of revenue by the government and also by the people. The relation between the forests and forest dependent communities is changing form consumptive needs to commercial needs. This is leading destruction of diversity in the region.

The harvesting of NTFP in tropical forests is dependent on various factors. In these forests the low density of NTFPs per hectare invariably in deep inaccessible forest areas, requires long travel time. The yield per tree is low, and people who harvest the fruits might damage the regeneration capacity of the species as the establishment of seedling is reduced. The tenurial security influences the harvesting. We have attempted to study the ecological aspects of certain NTFP species in Uttara Kannada district.

In order to understand the dynamics of the NTFP harvesting and its impact on ecology, we conducted studies in selected forest region of Western Ghats. Through ecological studies we tried to observe the influence of harvesting on degradation of forest, on regeneration, species diversity, composition, and population structure of NTFP species.

There is a rapid change in the forest resources due to developmental activities and population pressure in the region. This has lead to the resource degradation.

Increased prices and tenurial problems motivate forest dwellers to harvest NTFP destructively in most of the cases. For example, Dhoopa (*Canarium strictum*), Rampatre

(*Myristica malabarica*) etc. are on the verge of extinction. The high price due to increased demand may lead to the extinction of Uppage (*Garcinia gummi-gatta)* species, if the extraction pressure continues.

One of our assumptions from observation and field experience is that the major reason for *extraction pressure* on NTFP is the problem of *property on tenurial rights*. In order to study this we tried to observe the extraction pressure of NTFP, in two different tenurial systems. In Reserve Forests (owned by the government) and its comparison in relation to the land with private ownership.

The **objectives** of ecological study are:

1. To understand the ecological changes in the region
1. Influence of tenurial rights on of harvesting methods.
2. To study regeneration status of NTFP species threatened with high extraction pressure.

The **methodology** was as follows:

1. Participatory mapping of forest resources or historical transact (PRA)
2. Line transact method and
3. Direct observation at the time of harvesting

Participatory Mapping or Historical Transacts - Participatory mapping was done by villagers. Villagers were asked to draw the status of forests in different phases/intervals of time, like ten years back, thirty years back and before. The map was drawn about the present situation of the forest around village. This helped us understand the changes in ecology of forests over the years. Results of such data from clusters are discussed in this report, as it is indicative of the ecological history of tropical forests of Western Ghats.

The historical transacts in the clusters have a common trend and they indicate the following characteristics.

- There has been a degradation of forest resources over the decades due to the increase in the population and high pressures on the forest resources.
- The total number of NTFP species harvested has decreased over the years. However, the list of NTFPs harvested for commercial purpose has increased.

- NTFPs harvested for household consumption has decreased whereas the NTFPs harvested for a commercial purpose has increased.
- The increased demand for certain NTFPs has lead to overharvesting of species, leading to the destruction of the resource.
- The availability of NTFP from natural forests is declining due to government policies of logging and monoculture plantations.
- The present marketing system has no incentive for sustainable harvesting of NTFP.
- The NTFPs have great demand in urban areas for various purposes leading to increased prices.

Line-transact method:

Two regimes of harvesting, *heavily harvested* (HH) and *lightly harvested* (LH) have been identified based on proximity of area to villages and previous observations. In each regime, five linear transacts of one km length and 20m width were laid radiating out from village. In each transact, all NTFP species along with some dominant species were recorded. In this transacts, GBH (Girth at Breast Height) of trees, heights of tree (approximate) and canopy cover were recorded. Observations were made for collection of fuel wood, litter collection, lopping, grazing, fire, etc. In addition, the number of cut, broken and dead stems, was recorded. In case of cane, number of shoots, length, support for climbing, cuttings were observed. Further Diameter at Breast Height (DBH), class distribution and regeneration status of these selected species was analysed.

The method was time-consuming. We have studied only a limited number of NTFP species. We concentrated on those species having high extraction pressure. *Uppage* (*Garcinia gummi-gatta*), *Dhoopa* (*Canarium strictum*), Cane (*Calamus* spp), *Rampatre* (*Myristica malabarica*) and *Dalchinni* (*Cinnamomum zeylanicum*).

While selecting the transact, care was taken to include the two regimes with approximately same population density, soil structure, major tree species, latitudinal ranges. While selecting the two harvesting regimes we assumed that the terrain and the distance to be covered influences the collectors. People collect more from the nearest place than from a distant forest.

Table-7.1

Information about transacts

Transact No	Nearest Village/House	Approx. population of village/hamlet
1HH	Nilkund	150
2HH	Thanya	100
3HH	Lakkisaval	35
4HH	Nandyane	25
5HH	Mulgund	75
1LH	Olakote	0
2LH	Doddaante	5
3LH	Bangalegudda	3
4LH	Guddekote	0
5LH	Nishane gudda	0
HH indicates Heavily Harvested and LH indicates Lightly Harvested regimes		

Direct observation at the time of harvesting - From our experience of direct observation we learnt that when we go inside the forest with collectors while they are collecting the NTFP, they will not collect in their usual method. In other words, we cannot assess the destructive method of harvesting, which is common for the commercialised NTFP like *Rampatre*, Dalchinni and *Uppage*.

So, we identified some trees in the Reserved Forest as well as in the private land, in heavily harvested (HH) area and in lightly harvested (LH) area. Each tree was observed on alternate days for harvesting. When we observed that the tree had been harvested, information was collected about the harvesting. Data about GBH per tree, yield of tree, quantity collected from the tree, method of harvesting were recorded for the trees. Harvesting pressure and impact of property rights were recorded.

Description of Selected NTFP species:

***Uppage* (*Garcinia gummi-gatta*):**

Uppage is one of the six species of *Garcinia* found in evergreen forests of the Western

Ghats of Karnataka. Other local names of this plant are Dhad Birind, Kondapuli and Dharambe. It is a medium sized, tree found in the evergreen tropical forests of the Western Ghats. The tree grows straight, with branches perpendicular to main stem. This tree grows in the middle layer of the multi-layered tropical wet evergreen forests.

The fruits of *Uppage* are yellow in colour, with wrinkles ranging from 6 to 9. The rind is thick with high percentage of moisture/water content. The endocarp of seeds is used for extracting oil.

Patre (*Myristica* spp.):

Patre is general name used for *Myristica* species. These are medium sized tree that grows in the deep evergreen forests of the Western Ghats. There are three sub species of trees observed in the forest. They are locally called *Rampatre*, Giddapatre, and Heda patre (or Hedamangala). The original Ramapatre trees are very rare in the forest. The local variety known as `Giddapatre (*Myristica beddomi*)' and 'Hedapatre' (*Knema attenuata*) is being collected in the name of Ramapatre. All these species look similar though thre are minor differences. The fruits of Ramapatre are big compared to Giddapatre and the trees slightly black compared to the latter. Since the ecological requirements for both these species are same, we identified only Giddapatre *(Myristica beddomi)* for our observation. It is very rare to come across of *Rampatre* (*Myristica malabarica*). This is one of the endangered species of the region.

Cane (*Calamus* spp): Mainly two species of cane are found in the study area. They are locally called as *halu betta* and *handi betta*. We collected data for only *halu betta* (*Calamus rotang*), commonly used in the region. It is used by the villagers as fibre, and weaving handicrafts and articles.

Dhoopa: (*Veteria indica*): Boswellia *saratta, Canarium Strictum, Vateria indica* are all locally called Dhoopa. All these species are used for collecting Dhoopa. We have selected one of the most endangered species *Vateria indica* for our study, as it was one of the trees abundantly available in the region. This is a straight tree found in the evergreen to semi evergreen type of forest. Resin is extracted by making a scratch on the stem as in case of Rubber.

Dalchinni *Cinnamomum zeylanicum*.): An evergreen, medium sized tree found in the natural forest. Buds and leaves are used as spices. Small buds are collected by cutting the

branches of trees and later separating it from the branches. This practice of collection is leading to the extinction of this species. Leaves are extracted to use as spices.

RESULTS OF THE STUDY:

Density of selected NTFP species: There is hardly any difference between densities of the NTFP trees in both Lightly Harvested (LH) and Heavily Harvested (HH) regimes. All species except Dalchinni have slightly higher density in LH than in HH.

Table No: 7.2

Diversity of NTFP species in two regimes:

Name of NTFP Species	Density/ha	
	HH	LH
Uppage (*Garcinia gammi-gatta*)	81.7 ± 19.73	99.3 ± 30.87
Giddapatre (*Myristica beddimi*)	34.52 ± 11.47	44.13 ± 31.41
Cane (*Calamus* spp)	83.92 ± 21.14	97.26 ± 22.44
Dalchinni (*Cinnamomum* spp)	8.13 ± 3.48	4.59 ±5.31

***Uppage*:** The average densities of trees of *Uppage* above 10 cms GBH show distinct differences between the two regimes, LH and HH. Even though the number of trees above 10 cms GBH is the same in both regimes, the difference is distinct in groups of saplings of 1 to 10 cms GBH. This indicates that regeneration is affected in recent years. Collection of *Uppage* started about 15-year ago. However, destructive harvesting methods started due to competition among collectors since the past seven years. This might be the one of the reasons for such an abrupt difference in GBH class distribution.

Table No: 7.3

Size Class Distribution of Uppage trees in HH and LH

GBH GROUP	HH	LH	Probability	T value
	Average±SD.	Average±SD.		
1 to10	114.8± 44.81	295±24.34	0.000	6.06
11 to 30	43.5±18.51	56.8±20.70	0.316	1.06
31 to 50	14.2±9.52	13.4±10.16	0.901	0.13
51 to 70	5.4±2.30	9.9±5.00	0.121	1.71
71 to 90	5.4±3.44	5.4±3.51	1.000	0.00
91 to 110	4.1±4.56	5.2±3.27	0.674	0.43
111 to 130	6±4.69	3.4±1.52	0.293	1.12
150 and above	3.1±2.97	5.2±2.17	0.240	1.26
All individuals above 10 GBH	81.7±19.73	99.3±30.87	0.319	1.05

Cane: Average maximum length of canes in a clump is 1.78 Mts., and 7.68 Mts. in Heavily harvested and Lightly Harvested regions respectively. No. of cuts in a clump is 2.10 and 0.28 in HH and LH respectively. This clearly indicates that there is greater harvesting pressure in heavily harvested regions.

CANE: A CASE STUDY OF OVER HARVESTING

Cane (rattan) is one of the important NTFP in the tropical forests of Western Ghats. The articles prepared from cane are used for agricultural and domestic purposes. However, since the last two decades, the demand for cane has increased several folds basically due to the fad for cane furniture in urban areas/cities. This has had adverse impact on the resources. Due to the high price offered by the city-based industries, the farmers do not get the required cane for agricultural purpose. This increased demand has also led to over exploitation of the resources leading to the scarcity.

There is an excellent case study (Mallikarjunar, 1996) of the over exploitation of cane from the tropical forests of Anshi, in Karwar Forest Division. *Kunbis*, a forest dwelling community have been traditionally engaged in weaving cane articles like baskets. They collect the cane from nearby forests. The Karnataka Forest Department figures of extraction of cane over a period (1992-1996) from this region reveal that Kunbis removed 17% of the total harvest whereas KFD removed 83% of the harvest. The Forest Department was supposed to provide cane to the local people. In reality, they have not distributed cane to *Kunbis*. Most of the cane harvested by KFD is supplied to cities like Bangalore (the state capital). This case study shows how the official policies are causing over extraction of the cane resources. The policy of supplying cane at concessional rate to based industries has had negative impact on the resource base, leading to destruction of the resource.

Usually villagers cut the cane when it grows above around 2 mts. The numbers of cuts are also observed more in the heavily harvested region. Recruiting percentage is about 44 % more in lightly harvested region (LH) than the Heavily Harvested region (HH). Density of clumps per hectare is 83.91 in HH and 97 .258 in LH.

This clearly implies that harvesting of cane affects both density and size of the clumps.

Table No: 7.4

Stems/clumps, Height of Cane in HH and LH

Cane	LH	HH	T value	Probability
	Mean ± SD	Mean ± SD		
Stems/Clump	13.62 ± 2.92	3.40 ± 1.46	5.68	0.0004
Height (m)	7.68 ± 1.38	1.78 ± 0.72	6.72	0.0001
Cut/clump	0.28 ± 0.41	2.10 ± 0.66	4.75	0.0014
Density	97.26 ± 22.44	83.92 ± 21.14	0.96	0.3617
Regeneration	69.4 ± 24.87	30.6 ± 17.46	2.78	0.0238

Observation at the time of Harvesting:

Uppage **(*Garcinia gummi-gatta*):**

Collection practices and ecological impact: Fifty trees were identified in different tenurial systems. Ten each in *betta*, encroached land, five in distant forest (lightly disturbed forest), and twenty-five in Reserved land. Each tree was observed before harvesting. Information about expected yield in each tree was noted with the help of two local collectors. Later each tree was visited every alternative day and percentage of ripe and unripe fruits was noted. If it was found that some tree was harvested, then percentage of fruits left in the tree, the method of harvesting, the number of branches cut etc. were noted. Approximate quantity and quality collected by collector was estimated with the help of data from the previous day's observation. Besides, wherever possible, actual harvesting by collectors was observed.

To cross check the data all outlets and markets, viz. intermediaries, agents dealing in the village were asked to give the actual quantity and quality of *Uppage* rinds.

Method of harvesting:

Open access area: This is the region in the Reserve Forest where villagers frequently collect NTFP. This area is near the village and hence easily accessible. This region has considerably high density of *Uppage* trees.

Harvesting in open access areas near the village was more destructive compared to other areas. Collection from this region starts much before the other regions. Out of 25 trees

observed, 32% of trees were harvested before any fruits in the trees were ripe. Another 44% of trees were harvested when hardly 10% of fruits were ripe. 16% of fruits were harvested with only 20% of ripened fruits in the tree. All trees were harvested before 30% of fruits were ripe.

As harvesting of fruits in the open access region was nearing completion, people started collecting fruits from the distant forests. By that time, about 20% of fruits was ripe in most of the trees.

In the case of encroached forestland, the owner of the land harvests the fruits. In case of such encroached forestland, it was found that no fruits were harvested without any ripe fruits in the tree. About 10% of fruits were harvested from the trees with about 30% of ripe fruits. The maximum quantity of fruits harvested from the trees with 40% of ripe fruits (70%).

However, in case of *betta* no fruits were harvested before 30% of fruits in trees had ripened. Most of the fruits were harvested (60%) when there were 40% of ripe fruits in the tree. Some trees (10%) in fact, were harvested after the fruits were ripe.

On an average, almost 88 % of total fruits in *Uppage* were harvested before 40% of fruits in a tree were ripe. More unripe fruits are harvested from open access areas followed by distant forests (non-tenure regime). Trees in *betta* and encroached lands are harvested with more ripe fruits (tenured regime).

Table – 7.5

Uppage: harvesting pattern:

Region	Total Branches	Branches cut	Total	% of damage
Tenure	521	0	521	0
No Tenure	749	200	949	21%
Total	1270	200	1470	13.6%

Chi-square = 127, $p<0.001$

Region	Total Fruits	Fruits remaining	Total	% Fruits remained
Tenure	11506	200	11706	1.7%
No Tenure	28031	749	28780	2.6%
Total	39537	949	40486	2.3%

Chi-square = 38, $p<0.001$

Harvesting methods: The above tables show the details about the branches cut in tenure and non-tenure regions. Also, it shows details of fruits remaining in the trees after harvesting.

It is observed that out of 25 trees in the open access area, about 11 trees were badly damaged with cutting of more than 20 % of branches. Another four were partially damaged, with cutting of one or two branches. In the case of distant areas, out of five trees observed three trees were damaged severely (more than fifty percent of branches were cut.). In the case of the encroached area, fruits were harvested when 87.56% of fruits ripened.

However, in the case of *betta land* no tree was observed damaged. In fact, out of ten trees regularly observed, from two trees, fruits were collected only after they naturally fell on the ground.

In both the regimes very small number of fruits remained in the trees leaving lesser chances for natural regeneration.

Conclusions: Tenural security plays an important role in deciding the harvesting method of trees. Trees in open access areas are harvested first followed by trees in reserved forests far away from villages. Encroached lands and *betta lands* are harvested much later. In other words, trees in open access areas were harvested with maximum unripe fruits compared to trees on encroached lands and *betta lands*. In addition, it was found that harvesting methods were most destructive in open access areas. However, in *betta* and encroached lands, there were always chances of theft. Therefore, some of the *betta land* holders and encroached landholders harvest the crop/fruit before they are completely ripe.

Giddapatre(*Rampatre*) *Myristica beddomi:*

Methodology of data collection:

This tree is commonly found in good natural forests. It is difficult to find them in regions having tenurial security or in privately owned land. We were able to identify only two trees in *betta lands* and five trees in encroached lands. All the trees observed are *Myristica beddomi*. In all, we have identified about 30 trees with fruits.

The trees were observed at regular intervals. Information about total fruits in the tree, total ripened fruits, GBH (Girth at Breast Height) of tree, approximate height of the tree were recorded for each of these trees. Later, each of these identified trees was observed at an interval of 4 to 5 days. Whenever the process of the fruits being collected was observed, information like fruits remaining in the tree, disturbance made to tree and method of collection was recorded.

Wet to dry ratio: Fruits collected by forest dwellers were counted before they removed the mace from the fruits. Later, the weight of both wet and dried mace was calculated. This was done for mace of completely mature fruits as well as immature fruits. Hence, the loss in weight and price by collecting the unripe fruits were calculated.

Observations:

Men usually collect the *Patre*. They have to go deep in the forests in the morning with a sickle and a bag. After identifying a suitable tree, they climb the tree to pluck the fruits. They usually neglect the tall trees with few fruits. In other words, they prefer to collect many fruits from trees spending as little time as possible in the process. After plucking the fruits, they de-husk the fruits using a stone. The outer shell is removed to get the mace around the fruit. In the process, the seed is crushed and left in the forest. The men bring only the mace of the fruit. It is observed that most fruits were collected from the tree before they fully ripen.

It is observed that about 27% of trees were harvested with no ripened fruits on them. Trees with only 10% of ripe fruits were harvested in about 17% of observed trees. 23% of trees were harvested with only 20% ripened fruits and another 20% of trees were harvested with 30% of ripened fruits. All fruits were collected before about 60% of fruits were ripened in a tree. Hardly 6% of fruits remained in the tree.

Destructive methods of harvesting like cutting of branches were observed in about 62% of trees. About 1 to 12 branches were cut from each tree.

It was found that collection of unripe fruits affects weight and price of the commodity. It was calculated that there were about 20% of weight loss for unripe fruit. The price for unripe fruit also decreased from Rs. 130 for ripe mace to Rs. 85 for unripe mace.

Impact of tenure: Unlike *Uppage*, the harvesting methods of *Patre* are almost the same for open access natural forests i.e. with about 30 % of ripe fruits. This is because the

owner of the *betta land* was not interested in the small quantity of *Patre* available from the tree. He, therefore, did not give much importance to protect the fruits. The same collectors who collect from the forest collect fruits from *betta land*. They follow the same harvesting procedure as they do for collecting fruits from natural forest.

However, in case of encroached lands, (poor land owner) fruits were harvested with about 60% of ripened fruits, in more sustainable manner, without damaging any branches.

VFC provides Tenurial Security

Name of the village and VFC: Bangane

Taluk: Kumta

Forest Range: Kumta

Division: Honnavar

"Bangane" is a village, situated on the bank of Aghanashini River in Kumta taluka of Uttara Kannada District. It is surrounded by thick evergreen forests on the foothill of the Western Ghats. The major NTFPs like *Uppage*, *Rampatre*, *Dalchinni* and *Heddapatre* are available in the forest along with a variety of subsistence NTFPs.

The major communities in the village are *Marathis* and *Havyaks*. The increased price of NTFPs motivated more and more people to collect *Uppage* from the forest. Some outsiders from Santeguli, the nearest village, and Kumta started collecting *Uppage* from these forests.

Increased extraction pressure resulted in destructive harvesting. Collectors started cutting branches and in some cases cutting the tree to extract as much as possible in the minimum time.

During 1996, VFC was formed in the village. Initially, the VFC concentrated mainly on plantations. However, last year, they decided to put an end to the process of destructive collecting *Uppage*. Villagers agreed to protect the trees. They prevented neighbouring villagers/outside villagers to collect *Uppage* from the village forest. It was decided to wait till the fruits on the trees were ripe. However, every villager was

informed about sustainable methods of harvesting *Uppage*. They collected ripe fruits with long poles, without damaging the tree.

Thus, this year (1999) all the villagers collected ripe *Uppage* fruits from the forest without cutting the trees. This, in turn, helped them in getting higher prices. This year (1999) the price for ripe and unripe rinds of *Uppage* was Rs 55 and Rs 35 respectively. All collectors got about Rs 20 more per kg of *Uppage*. In addition, they are assured of getting *Uppage*. Besides, they have started planting the saplings in their private land.

As Kanna says, " I have got five quintals of *Uppage*. In comparison to previous years it is more and has increased my cash income. In addition to this, it has given me the satisfaction of saving the *Uppage* trees from destructive lopping practices".

Conclusions:

1) Harvesting of *Rampatre* is done with mostly unripe fruits leaving very few fruits for regeneration.

2) Collection of unripe fruits results in decrease of weight and price.

3) De-husking of fruits damages the seed in the present system of harvesting, leaving no possibilities for regeneration.

Dalchinni Moggu (*Cinnamomum zeylanicum*.):

Dalchinni is a medium sized tree. Flowering buds are collected from these trees. Very few trees were observed in the forest.

Methodology of data collection:

Six trees were identified in the natural forests. In each tree, approximate yield, numbers of branches, GBH and approximate height was noted. These were observed regularly. After harvesting, each tree was observed for method of harvesting. To assess this, information was collected about the number of branches cut. The percentage of ripened fruits to total fruits collected was calculated. The ratio between number of branches cut to actual number of branches was also assessed.

Observations:

As *Dalchinni* buds are very small, collection or plucking buds from the branches is a very time consuming. So most collectors cut the branches and then pluck the small twigs from the branches. They carry the twigs to the house to remove the buds. It is in their homes that they separate the fruits from these twigs and dry them before marketing.

All the trees were harvested before fruits become ripe. The collection method was also destructive. About 76% of the branches were cut for harvesting. No buds were left on the trees. We were able to identify only six trees in the range of about 20 sq. kilometres. (It is learnt from the experienced forest dwellers that a tree will not yield if it is cut severely.)

Conclusions:

- ~ Harvesting method of *Dalchinni* is most destructive. No trees were observed with sustainable method of harvesting.
- ~ This tree is becoming rare due to lopping and over harvesting. The high commercial value is also responsible for over harvesting.

Dhoopa:

There are very few trees of these species in the natural forests. Due to over extraction, most of the trees have died. We were able to identify only five trees in 10 sq kilometers of forest. These were observed regularly. There are only two collectors involved in extraction of *Dhoopa*. Since there are very few trees and the availability of *Dhoopa* per collection is small, most collectors of NTFP do not collect *Dhoopa*.

We have collected data about the actual quantity collected from each tree from these two collectors. Besides, GBH, Height, scratch were measured.

Table No. 7.5:

Yield of Dhoopa

GBH of tree cms	Height in mts	Size of Scratch Cms (b*h)	Total quantity extracted (gms)		
			Per collection	No of collection	per year
85	5.0	20*35	150	9	1350
124	6.5	35*58	50	16	800
91	4.8	15*31	100	11	1100
68	4.0	21*17	119.50	14	1677.2
112	4.0	18*25	162.89	16	2608.0
					7535.2

Since only five trees were observed, the data is insufficient to arrive at a conclusion. However, it was observed that the yield has been decreasing over the years and that trees are dying.

The growth rate seems to be hindered by the extraction methods. However, this needs to be studied in detail. Also, regeneration of this species is not known. Seeds (20 numbers) directly sown have not germinated at all. It is believed by the villagers that a bird, locally called *'Dhoopada hakki'* is a necessary agent for germination. The villagers also claim that they have observed the seeds inside the stomach of dead birds of this species. This bird was identified as 'Imperial pigeon *(Ducula bicolor)*'. This needs be researched further.

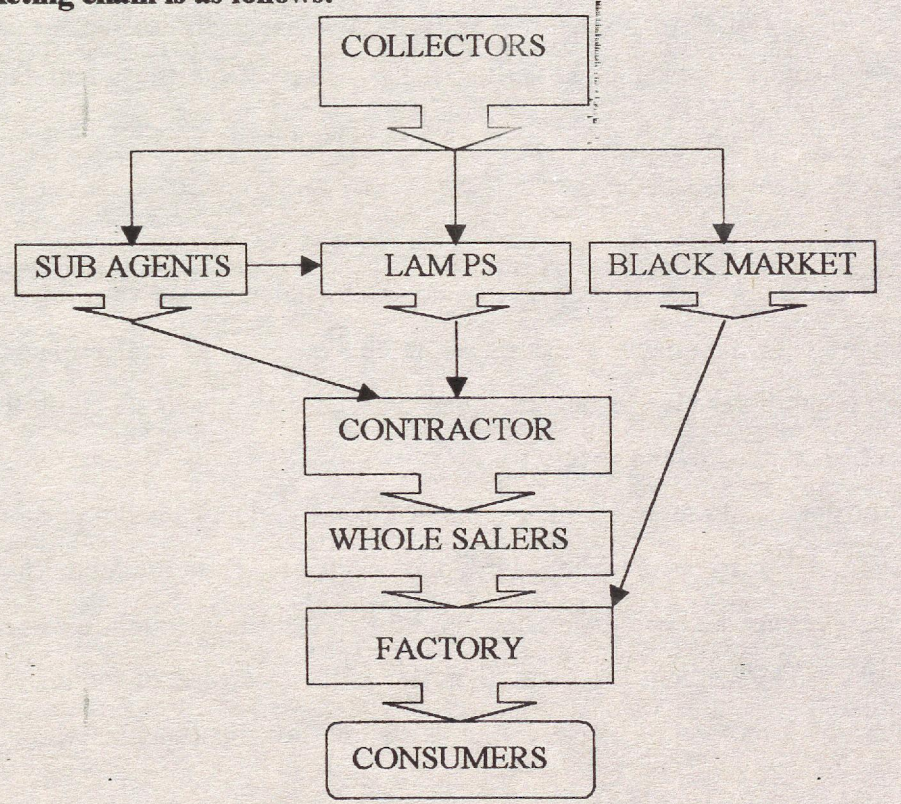
Conclusions: The harvesting of NTFP in the tropical forests of Western Ghats is done without any knowledge of ecological implication to the species. Though there is a great potential for sustainable harvesting of NTFPs, the present trend among the government as well as the collectors is directed towards maximum harvesting of a species disregarding the long term ecological implications. It is essential that a proper inventory of NTFP is developed with yield studies, regeneration surveys and harvest-assessments to make adjustments in harvests. Only through a well formulated management strategy it is possible to achieve the sustainable harvest of NTFPs.

CHAPTER 8

MARKETING OF NTFP

The market for NTFPs has increased in recent years. Traditionally, the major NTFP collected from the forests of Western Ghats was 'pepper'. Wild pepper was available in abundance and the forest dwellers extracted these from forests, part of which was exported to the Gulf and European countries. The market for NTFPs was slack in the sixties. However, during the 1980s the demand increased and new products were included into the NTFP fold. The household consumption of NTFPs decreased and the increased market demand changed the entire NTFP scenario. The discovery of new drugs based on plant resources accelerated the demand for NTFPs. The establishment of processing industries helped to find new markets for NTFPs. Based on the increased demand and reasonable prices for this produce, the collectors started harvesting the products. There are several ways/systems through which NTFP is marketed, the most dominant being the governments tender-cum-auction system and collection through government supported Large Scale Adivasi Multipurpose Society (LAMPS).

The marketing chain is as follows:



Collectors: The collectors, invariably forest dwellers, who form the base of this system, sell this produce to the local sub-agent. In many villages the sub-agent, appointed by the contractor is a petty shopkeeper or a hawker. They provide credit facility to the collectors, with the assurance that all the NTFP material is sold to the sub-agent. Thus, the person to whom the collector can sell is predetermined. The credit facility provided by the sub-agent is very crucial to the cash-strained household economy of the poor collector. He is aware of the cheating practices adopted by the sub-agent. Invariably the agent gives a lower price on the pretext that the quality is not good or that the processing has not been properly done. Other means of exploitation adopted by the sub-agent are the use of fraudulent measurements or weights. Unfortunately, the collector is not in a position to withhold the produce for a long time due to cash needs. In many cases, there is the problem of storage space as well as the perishable nature of the product. This also forces the collectors to sell their products at low rates. They are not in a position to spend time and money to carry the NTFP to the nearest town or market.

Sub-agent: He is a very strong link in the market chain of NTFP. He is appointed by the contractor to collect NTFP. Usually, the sub-agent gets his commission for collecting the produce from the contractor. In addition to this commission, the sub-agent exploits the vulnerable collector. As mentioned earlier, the collector avails the credit facility with high interest rates and he is forced to sell the produce at a lower price. The sub-agent is invariably a local businessperson, a shopkeeper, or a petty trader. He is conversant with the people who are involved in collection of NTFP. It is very difficult to bypass this sub-agent by the collector. The sub-agent's working strategies are so deep-rooted that his mechanism of collecting factual reports about the quantity of collection is accurate. Aware of this omnipresence of the sub-agent the collector has to succumb to the arm-twisting tactics adopted by the agent.

Inspite of the dominant presence of the sub-agent, some collectors sell a portion of NTFP to the '*smugglers*' or to people who offer a higher price for their produce. More than the collector, the person who buys the produce is at the risk of being caught for keeping stock of a particular NTFP without legal sanction. This is the existence of the black market in the NTFP trade. This kind of black market exists only for those items, which have high

market value, for example *Uppage* and *Murugalu*. The black market offers a higher price for the collector.

Contractors: The contractor is the one who obtains legal sanction from the KFD to collect NTFP. The method of auctioning of NTFP every alternate year for each particular range is followed by the KFD. The contractors bid in the auction and the highest bidder gets the contract.

However, in order to safeguard the interest of contractors, there are many instances where the contractors form '*rings*' among them and restrict the rise of prices in the auction. The formation of '*rings*' among the contractors is a clever strategy to keep the price of NTFP at a low level. They do not allow the rise in price, the '*ring*' decides the price payable for the NTFP. This is another way of controlling the price of NTFP by contractors.

Auction by KFD: The State Forest Department auctions the right to collect commercial NTFPs once in two years. Normal auctioning proceedings are followed and one who bids the highest gets the tender or contract for two seasons. The auction is conducted for each Forest Range. The VFC areas are excluded from the auction. The price of the bid is a kind of tax or royalty to the KFD to be paid by the contractor for the NTFP collected from that particular area and is not the actual price of the NTFP. The market price of NTFP will be several times higher than the bidd price. Once the contractor gets the tender for a particular NTFP, he is legally eligible to collect, store and sell this produce in the region.

Fixing of prices: The contractor determines the price of the NTFPs and the Forest Department has no say in this matter. The price fixed for a single NTFP may vary from region to region and from one contractor to the other at a given time. It also differs depending on the availability. However, in actual practice, the price fixed by the contractor varies marginally from one Forest Range to another.

Quantity: The quantity of NTFP collected in a Forest Range area is recorded by the KFD. It is an arbitrary number given by the contractor to the KFD and has no relation with the actual amount collected. This is because the Forest Department does not verify the figure given to them by the contractor, leaving plenty of room for manipulation.

NTFPs not auctioned by the KFD: The KFD auctions the major NTFPs available in that region. However, there are several other commercially important NTFPs, which are not

auctioned by the Forest Department. Coupled with the ignorance of the primary collectors, many contractors have taken advantage of this situation. It has been observed that the same contractors who have been given the licenses for collection of NTFP auctioned by the KFD, are also involved in the collection of non-auctioned commercial NTFP claiming the authority of their licenses to do so. This goes on with the connivance of the Forest Department officials in several areas.

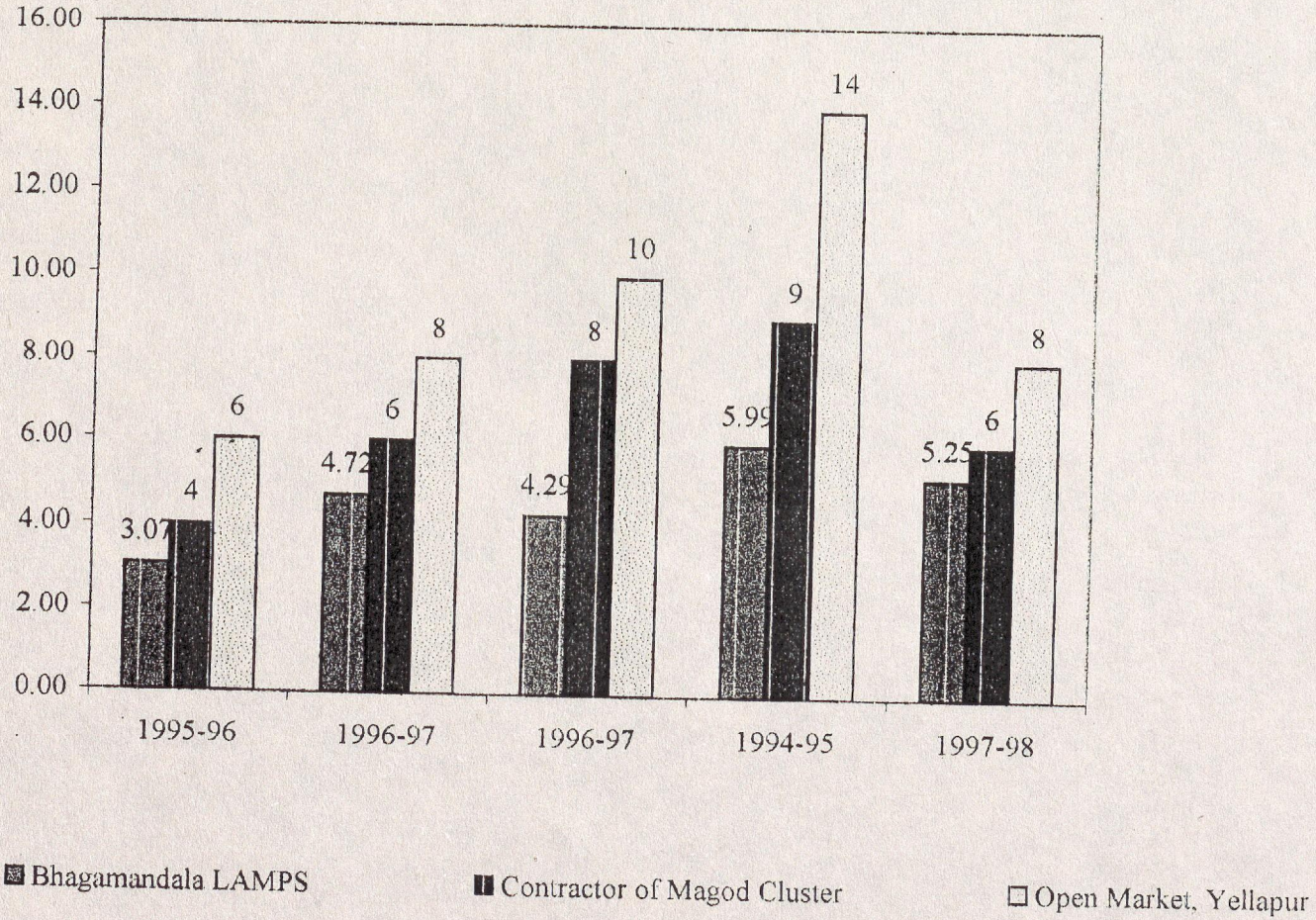
***Illegal traders*:** Illegal trading of NTFP takes place in two ways – 1) The illegal traders directly collect the product from the forest, and 2) The illegal traders approach the primary collectors offering a higher price than those fixed by the legal contractor. Traders involved in direct collection usually collect the products that are banned from collection by the Forest Department or used by the Ayurvedic pharmacies such as Gulmavu (*Machilus macarantha*), Dhoopa (*Veteria indica*), Dalchinni (Bark of cinnamon trees) etc. The second type of trader purchases mainly high priced NTFPs like Uppage from the primary collectors and sell these outside the state.

Collection pattern by the authorised contractors: The contractor, to whom KFD has auctioned the NTFP, recruits many sub-agents throughout the area allotted to him by the Forest Department For some of the major commercial NTFPs, the number of sub-agents appointed will be more than 75 for the area. The primary collectors have to sell their products only to these sub-agents who in turn pays the price for the NTFP as fixed by the contractor. For this purpose, the contractor gives the sub-agent cash in advance and he gets a commission from the contractor on every kilogram of product collected.

Collection pattern by the unauthorised contractors (Smugglers): These contractors either directly purchase the products from the collectors or recruit agents to purchase certain highly priced NTFPs. There may be many such contractors in a single region. Usually they pay little more than the price fixed by the legal contractor. In certain cases, due to the intervention of the illegal contractor, the authorised contractors are forced to hike their collection price.

Local dealers: Apart from authorised and unauthorised contractors, there are some local dealers who purchase some of the NTFPs directly from the collectors. Although they do not have any legal sanction to do so, they operate on a very small scale. The local dealers purchase the NTFPs that are popular such as honey, cane and bamboo artefacts, wild

Figure 8.1 Price (in Rs) given to collectors by different marketing systems for Seege



vegetables, fruits and roots as well as medicinal plants. These products are sold to other neighbouring villages where these products are not available and to tourists if the village is located near the highway.

Ayurvedic pharmacies/Traditional medicine men: Ayurvedic pharmacies train people in the identification and harvesting methods of medicinal plants, these people then collect the products directly from the forest. This is illegal, since there is no permission to collect barks, roots, and leaves from the forest. In case of traditional medicine men in the village, collection of the products is done as and when they require.

Marketing through V.F.C.s:

The launching of Joint Forest Planning and Management (JFPM) and the formation of VFCs (Village Forest Committees) has been claimed as one of the solutions to resolve the issue of marketing of NTFPs. The VFC is an institution created to overcome the hurdles of intermediaries and the contractor system that led to an exploitative relationship between the collector and the marketing agencies. Legally, the KFD had given collection rights over NTFP to VFCs. While giving the NTFP tender to contractors (or while auctioning the NTFP), the area which falls under the purview of the VFC is excluded from the auction. It is clearly mentioned that the VFC has exclusive right over collection of NTFP from the VFC area. The constitution of VFCs has its advantages and disadvantages. The formation of VFCs in certain villages has improved participation of the community in the protection of the forest, and hence improved relations with the Karnataka Forest Department and reduced the incidence of forest fires. Regulation of collection of NTFP was also made easier with improved monitoring and control of harvesting. The policy of giving NTFP collection rights to the VFC is *prima facie* rational. However, while implementing this at the village level one can see the failure of this policy causing financial loss to the NTFP collectors.

Marketing through LAMPS: Large scale Adivasi Multipurpose Society (LAMPS) was established by the government with the main objective of protecting the interest of *Adivasi,* the tribal people who collected NTFP. Realising the dependency of tribals on NTFP collection, the government wanted to protect them from the clutches of contractors. In order to safe guard the interest of tribals, who collect NTFP, the LAMPs was formed. It was supposed to provide market and assure reasonable price for the

product. In the study of clusters, there are many areas where LAMPs is operating. The experience of collector shows that the LAMPs appoint their sub-agents to collect the NTFPs. Many times, these sub-agents employ the tribals to collect the NTFP. The NTFP collector becomes a labourer. This system of appointment of sub-agents has introduced another middlemen in the marketing chain. The inefficiency of the government system has creeped in to LAMPs and they have failed to protect the interest of the tribals who collect NTFPs. The comparison of price given by different marketing systems for *Seege* in different clusters shows that LAMPs offers the lowest price in comparison to the contractor or the open market system.

Siddi Development Co-operative Society for NTFP marketing:

This society, formed in 1994 in Manchikeri, consists of 80% members belonging to the Siddi community and the remaining 20% from the *Gouli* and *Kunbi* communities. The society got the lease to collect and market *Seege* for 4 years, 1994,1995,1996 and 1997. During 1994-95, the society collected about 390 quintal of *Seege* and during 96-97 it has collected 385 quintals. In the first year of collection of *Seege* the society purchased the product at a price of Rs 8 to 10 per kilogram from the collectors. The society collected 190 quintals of *Seege* in the first year and invested about Rs16.50 per kilogram of *Seege* including the royalty it has to pay to KFD. The society paid Rs.122500.00 to KFD as royalty. They tried to sell the product in Bangalore, Pune, and Belgaum and Khanapur, but could not succeed due to various reasons.

Lack of knowledge about the end market is one of the major reasons. The industries agreed situated in cities to purchase the product at a price of Rs15 per kilogram from the Society. However, the Sirsi-based contractor purchased an initial 100 quintals of *Seege* at a price of Rs 16 per kilogram and the remaining 90 kilograms for Rs17. Thus, the product was sold to the local contractor at a no-profit, no-loss basis during the first two-year period. But for the second period, the society sold the *Seege* to the same contractor with a net profit of Rs. 70,000. The Society collected *Seege* at a price of Rs 8 to 10 per kilogram from the collectors and Rs12 per kilogram from those collectors who have *Seege* in their private lands. The royalty paid to KFD was Rs.1,35,000. During 1998-99 the Society wanted to get the lease for *Seege* collection and sale but KFD increased the royalty. Thus, the Society decided not to get the lease.

The Society feels that it is not possible to compete with the contractors. The contractors have enough capital and are dealing with several NTFPs. It was also observed that the contractors are able to store NTFP until the price of the product increases. They have total knowledge of the marketing chain and can control the entire market system. Besides, they have a lot of experience and have been in this field since a long period. They also know kinds of tactics to avoid entry of new NTFP dealers to avoid competition.

CHAPTER 9

WORKSHOP OF NTFP COLLECTORS IN THE TROPICAL FORESTS OF WESTERN GHATS

Non–timber Forest Products (NTFP) are an integral part of the livelihood of forest dependent communities in the tropical forests of Western Ghats of Karnataka. These NTFPs are collected by villagers for a variety of uses like fuel wood, fibers, brooms and many more edible and non-edible uses. However, the relation between the villagers and the forests in tropical forests is changing over the years. Forest is considered as a commercial asset to earn cash income. This commercial view is replacing the traditional view of NTFPs, as main source of consumptive needs. In order to under stand the dynamics of NTFP collection, we organised five Workshops of NTFP collectors in different parts of the Western Ghats. Main objectives of these workshops are:

Firstly, sharing the outcome of the study in whole tropical forest region of Western Ghats among the forest dependent communities. Sharing of differences and similarities observed in collection patterns, marketing systems, use patterns, their merits and demerits. This exchange is expected to help the forest dependent communities to adopt more sustainable harvesting techniques and hence the conservation of the tropical forests. The workshops also provided an opportunity to bring the forest officials and the NTFP collectors on a single platform.

Other objectives of the Workshops are:

1. To organise NTFP collectors
2. To have an insight into the problems faced by NTFP collectors in the region
3. To seek collectors opinion for future development and policy recommendations
4. To develop indicators for sustainable harvesting techniques
5. To evolve a strategy to regenerate NTFP stock
6. To search for possibilities of installing NTFP processing unit and to under stand the market chain so as to protect the interests of the forest dependent communities.

Five workshops were held in different parts of the Western Ghats. We have attempted to give brief report of these workshops. They were held in

Hukkali in Bandala cluster, Malgi, Kogar, Achave and in Anshi clusters.

HUKKALI

Name of the Place: Hukkali

Taluk: Siddapur

Uttata Kannada

Karnataka

Hukkali is situated on the crest-line of Western Ghats. It is a remote village about 32 kilometers from Sirsi, 35 Kilometers from Siddapur, the taluka headquarter.

This village was selected for the workshop taking various reasons into account. Out of about 3000 acres of total geographical area, about 2800 acres of land are under tropical evergreen forest. Only about 140 acres is cultivated in the village. Out of total population 398, about 356 are *Kharevokkaligas*, one of the highly forest dependent communities residing in the region. They have been collecting a variety of forest products.

The workshop was arranged in this village on 4 December 1999. This workshop was attended by Range Forest Officer, foresters, guards of the region, environmentalists, members of 'Prakruti', and about 150 villagers including about 75 women members. Local journalists were also present during the workshop.

The workshop started by worshipping an *Uppage* (*Garcinia gummi-gatta*) tree, one of the highly commercialized NTFP yielding tree, by an old man Parama Gouda, of the *Kharevokkaliga* community. He spoke about the sustainable harvesting of NTFPs and establishing harmonious relationship with the forests as it was in earlier times.

To begin with, objectives of workshop and the experiences of the study were shared with the people during the first session.

The second session provided an opportunity for interaction of Forest Officials and people. Villagers shared their opinions about the sustainable harvesting techniques of the forest products and hence the sustainable lifestyles. Dyava Gouda drew the attention towards the importance of tenurial security for sustainable harvesting of NTFPs in tropical forests. He said that properly demarkated village boundary in forests, and responsibilities to village level institutions can help in sustainable harvesting of NTFPs.

The NTFP collectors asked the forest officials about their rights to collect NTFP from the forests. This session was interesting as people asked many questions to the Range Forest

Officer. For the first time in the history of this village, there was a dialogue between villagers and a forest official. The policy of allotting tenders to contractors, and how this has resulted in destruction of species like *Dhoopa* was explained to people and forest officials. The need to change the NTFP policy was emphasised in the workshop.

Malgi

Name of the place: Malgi

Taluk – Mundgod

Uttara Kannada

Karnataka

The workshop was held on 8th February 2000 at Malgi. The members of 'Prakruti', local NGO Vikasa, NTFP collectors from this cluster and KFD officials ttended this workshop. It was organised in collaboration with Vikasa. About 48 people participated in the discussions. There were 20 women members. In the first session, the objectives of the workshop, and the results of the NTFP study were explained to the people.

Maximum number of NTFPs (26 NTFPs) are being collected in this cluster for commercial purpose compared to other study clusters. This matter was discussed during the workshop. The participants opined that lack of employment opportunities has forced the people to collect more NTFPs for commercial purpose even though the earnings from collecting these NTFPs is meagre in comparison to the daily wages. The commercialisation of the products, over harvesting, possibility of establishing processing unit and marketing network was also discussed during the workshop.

The participants agreed to implement the possible ways for sustainable harvesting of NTFP's .

The collectors were requested to restrict the collection of certain NTFPs for commercial purpose like Bamboo shoots, Dalchinni leaves, bark, and Ichalu (*Phoenix sylvestris*) leaves to allow regeneration.

It was decided to search for possibilities of installing a processing unit for NTFPs, like Nelli (*Emblica officinalis*) and honey.

Discussions about marketing channels:

The details on each of the commercial NTFP were discussed. It included harvesting method, availability in the past and present, parts used, and the general use of the product. The price of the product and the price in the known and market, possibilities of processing unit and solution to the problems in collecting and marketing were discussed.

It was felt by all members who participated in the workshop, that present marketing channels are not giving appropriate price, or promoting sustainable harvesting of NTFPs.

As an alternate to the present channel, the possibility of Self Help Groups for marketing was discussed. The participants from Kotekoppa village related their experience with the Self-Help Group (SHGs) that they have adopted in their village.

SHGs, a group of women members of the village have collected several NTFPs available in the region. However, the marketing was a major hurdle. They decided not to sell the products to local dealers considering the low price offered by them. This group directly contacted the main contractor in Sirsi. They were able to sell product *Taarekayi* (*Terminalia bellerica*), *Seege* (*Acacia concinna*) and Guddegeru (*Semicarpus ancardimum*) and seeds of the some timber species like Teak (*Tectona grandis*) and Hulagala. They got about Rs 2 more per kg than in the village for Guddegeru. The price of Guddegeru was Rs 4 in the village. The contractor offered them Rs 6 per kilogram. This kind of effort to market the product has encouraged the participants to start SHGs in their village.

Villagers opined that there is need to search for a alternate market motivated for NTFPs available in this village to get good price thus avoiding entry of several intermediaries especially to those products like *Vayuvidanga*. (Medicinal herb).

Vayuvidanga *(Embellia ribes)* is a NTFP widely used as medicine and locally used as birth control measure. The product is locally sold at price of Rs 3 per kilogram of wet seeds. However, the same product is sold at a price of Rs 300 in Bangalore per kilogram after drying. This is nearly 75 times more than the price, which is sold locally.

The workshop thus helped to organise the collectors and to discuss their problems and find the solutions. It also gave opportunity for interaction with KFD officials.

Achave

Name of the Place – Achave

Taluk – Ankola

Uttara Kannada

Karnataka

The workshop was held in Kuntgani village of Achave cluster on 6 March 2000. Sixty-eight people participated in the workshop, including 31 women. The workshop was organised along with Hindulida Guddagadu Abhivridhi Samiti a local NGO. Objective of the workshop and details of the study of Achave cluster were explained to the participants. Afterwards a group discussion was held among the villagers, Prakruti members and with local NGO representatives. The possibilities of sustainable harvesting of certain NTFP like *Uppage* (Garcinia *gummi-gatta).* Dalchinni (*Cinnamomum zeylanicum)* and Ichalu *(Phoenix sylvestris)* Dhoopa *(Veteria indica)* were discussed.

Various methods practiced by communities to conserve the forest and sustainable harvesting techniques in different villages were explained to the villagers. For example in Bangane village (Kumta taluk) the villagers have decided to harvest only the ripe fruits of *Uppage* thus avoiding the harvesting of unripe fruits and young nuts. This has also helped towards sustainable harvesting of the product since the cutting of branches of the tree or even of trees felling is voluntarily banned by people.

Community efforts to conserve the natural forest areas in Manmane village of Siddapur taluk and several other villages in adjacent Shimoga district were also discussed during the workshop.

Possibility of installing a NTFP processing unit is discussed to enhance the quality of the product and to preserve the products until this can find out a good market and good price for certain NTFPs.

Villagers felt that the local NTFP collectors are not getting the proper price for NTFP due to the entry of several intermediaries in the marketing chain. They felt that knowledge of the end market is essential to avoid intermediaries.

Domestication of the product: During the workshop a young woman from Motigudda hamlet explained the process of conservation of Murugulu *(Garcinia indica)* plants on her their farm. Her father and grand mother have regenerated more than 75 Murugalu plants in their private land. These plants are naturally grown here and her family members just protect them. Now the family is earning cash involve through collection and sale of the fruits.

Anshi:

Name of the Place – Anshi

Taluk – Karwar

Uttara Kannada

Karnataka

Workshop at Anshi was conducted in front of one of the *Kunbis* house. About sixty villagers including 23 women attended the meeting. The meeting started with informal discussion about the Self-Help Group, National Park and NTFP issues.

Results of the study were explained to villagers. The following subjects were discussed in detail.

- ~ Contribution of NTFP income in total income of forest dependent communities and its relation with caste and economic condition
- ~ Employment opportunities available through collection of NTFPs
- ~ Gender and NTFP issues
- ~ Direct (economic) and indirect benefit from the forest products
- ~ Loss of knowledge of NTFPs over the years
- ~ Changes in pattern of NTFP resources over the years
- ~ Impact of harvesting of NTFP for commercial purposes on natural forest

- ~ Importance of tenural rights in assuring the sustainability of the forest resources while harvesting
- ~ Conservation of the resources through domestication of certain NTFP species.
- ~ Marketing systems and its problems, suggestions for alternative marketing systems.

People of the region have been living inside the National Park. The Karnataka government has notified Anshi as a National Park. They have been collecting the forest resources for centuries to sustain their livelihood. Their dependency on the forest resources is one of the highest, in the region of Western Ghats. This was the outcome of the study. Besides this, forest resources have helped them in getting employment in the lean season.

Under Joint Forest Planing and Management (JFPM), Karnataka Forest Department constituted eight Village Forest Committees (VFC) in the region, inside the National Park. These VFCs took initiative to harvest *Uppage* (*garcinia gummi-gatta*) and cane on sustainable basis. The JFPM wing of the Forest Department appreciated this action of the VFC to conserve the forest resources. However, on the contrary the wildlife wing warned the VFCs that they couldn't collect NTFPs from the National Park. Legally the forest dwelling communities cannot collect the NTFP from National Park. This has led to severe conflict between people and KFD.

Conclusions of the Workshop:

Villagers agreed to conserve the NTFP resources using their traditional system of marking the trees for individual families/villages. To explain this in short, traditionally villagers of this cluster mark the NTFP tree for individual families before the product is harvested. Only that particular family can harvest the product from this tree. This, which ensures the tenurial security of a resource, helps in managing sustainable harvesting of NTFP resource. However, this practice is applicable for only certain types of NTFPs viz., Honey and Vatekayi *(Artocarpus lakoocha*).

Villagers decided to extend this practice to other recently commercialised NTFPs like *Uppage* (*Garcinia gummi-gatta*) and Dalchinni (*Cinnamomum* spp), which are facing severe threat of extinction due to unsustainable harvesting practices.

Villagers also decided to mark the boundaries of each village in the forest for collecting the NTFP resources to avoid the conflict with other villagers.

They took an oath to conserve the forest resources and in turn, they requested the Government to allow them to live inside the forest. Datta Velif, one of the tribal leader concluded the meeting, by saying " W*e may not ask for high commercial price for NTFP but we need the forest because it is our life*"

Kogar

Name of the place – Kogar

Taluk – Sagar

Shimoga

Karnataka

Date of Workshop: 27 December 1999.

Kogar is situated in Northern part of Shimoga, a district headquarter in Karnataka. Sharavathi Wildlife Sanctuary. The Sanctuary was declared in declared in 1972 and is surrounded by the backwater of Linganamakki dam. Villagers have to go to Sharavathi Wildlife Sanctuary to collect forest products.

This fact was mainly reflected in the workshop. Legally NTFP collection is not allowed inside the Sanctuary. However, the villagers have been collecting them for several years. Even though it is illegal, people continue to collect the products.

About 50 people attended the workshop, including 15 women. Workshop was initiated by a local leader. He stressed the importance of the forest resources in livelihood of villagers. Then the objective of the workshop details of study of Kogar cluster and general details of the study in Western Ghats were explained to the members participants. Assistant Conservator of Forests, Wildlife Division, Karnataka Forest Department explained the important forest products, different uses of forest resources as medicine, food, household needs as source of income.

Results: Fuelwood harvesting is being done in a destructive manner was mentioned in the previous chapter. This was rightly pointed out in the workshop by the President of

Mandal Panchayath. Villagers were convinced that the clear felling of an area by cutting green trees and plants for fuelwood collection is a destructive method followed by them. Villagers agreed to take fuelwood from the branches twigs of trees. The harvesting methods for honey, and *Uppage* have resulted in over exploitation. Possibilities of sustainable harvesting methods were discussed to avoid such over exploitation.

The sustainable harvesting methods discussed in the workshop are as follows.

Uppage: The participants agreed to collect only the ripe fruits, as much as possible. Presently the unripe fruits are harvested leaving very little chances for regeneration. This has also affected the food sources of wild animals.

Dhoopa: Harvesting of *Dhoopa,* a resin extracted from tree was also discussed. The tree is being cut destructively and some cases the trunk is set on fire to get more resin. This has lead to destruction of the species base. Small triangular patches can be made to extract Dhoopa on a sustainable basis.

****

The five workshops conducted in different parts of the region helped us to arrive at the following conclusions:

1. Sustainable harvesting of NTFP is possible only by providing tenurial security.
2. Small-scale processing units of NTFPs are the urgent need to avoid the exploitation of forest dependent communities. These will help in giving additional employment as well as higher income to villagers.
3. Organising Self-Help Groups (SHGs) in village will be a right step towards ensuring the sustainable harvesting of resources and providing fair price to the collectors. This will help collectors gain bargaining power.
4. The workshops held in five clusters helped to organise collectors. However, there is a need to strengthen this network further, and extending it to other areas in Western Ghats.

5. The workshops have helped the NTFP collectors to discuss their problems with the forest officials and others interested person/organisations. For the first time, this kind of opportunity was provided for two-way interaction.

CHAPTER 10

RECOMMENDATIONS

1. It is necessary to evolve a clear policy on NTFP at the national level as well as at the state level to safeguard the resources and the interest of NTFP collectors.
2. The forest dwelling communities should have the right over resources so that they have vested interest in protection of forests.
3. There should be a shift from timber based forest management to NTFP based forest management.
4. The afforestation programme needs to be reoriented towards planting of NTFP species. The natural regeneration of forests provides more opportunities for establishment of biodiversity and NTFP species. Under aforestation programmes effort should be made to regenerate more areas of natural forests.
5. The processing of NTFP must be done in areas of primary collection to increase the returns to the collectors. There is need to add value to NTFPs collected at the village level. This can be done with processing, storage, and enhancing the skills. Value addition improves the quality of the product and it helps in getting higher price for collectors. Small-scale forest based enterprises can also help in adding the value of NTFPs.
6. Trade restrictions on NTFP needs to deregularised.
7. The existing laws are inadequate to protect the interest of NTFP collectors as well as protection of the forest. There is an urgent need to change these laws to ensure proper utilization of NTFP and to protect the rights of collectors.
8. The present system of contractors or the LAMPS has not helped the collectors. In order to remove the exploitative marketing channels, it is desirable to build NTFP collectors unions to protect the interest of collectors.
9. Domesticating of NTFP species as well as propagation of these species at village level would increase the chances for building the resources.
10. There is an immediate need to halt the destructive harvesting methods and awareness should be created towards sustainable harvesting skills.

11. Ensuring tenurial security, to NTFP collectors will pave the way for sustainable harvesting of NTFPs.
12. There is need to develop an inventory of the NTFP resource. This will be the basis on which harvesting or extraction can be determined to prevent over extraction and over harvesting of resources.
13. There is need to raise awareness among government officials and other policy makers on the real significance of NTFP.
14. There are number of forest products having good nutritional and medicinal value. These can be explored and promoted for use by domesticating these species. Care should be taken to see that increased marketing of a NTFP does not disrupt local use or have adverse impact on the resources.
15. There should be some uniform policy in the state and national level for pricing and standardisation of measurement units of each NTFP item especially at the primary collector's level to ensure that the primary collector is adequately paid for the produce collected by him.
16. A survey should be carried out to assess the present status of NTFPs with regard to the availability and distribution of each of the economically useful NTFP species. The extraction should be based on this inventory.

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Acronyms

FAO	: Food and Agriculture Organisation of United Nations
JFPM	: Joint Forest Planning and Management
KFD	: Karnataka Forest Department
LAMPS	: Large scale Adivasi Multipurpose Society
MFP	:Minor Forest Products
MoEF	: Ministry of Environment and Forests
NFP	: National Forest Policy
NTFP	: Non Timber Forest Products
NP	: National Park
PRA	: Participatory Rural Apprisal
PESA	: Panchayats, Extension to Scheduled Areas
SHGs	: Self Help Groups
VFC	: Village Forest Committee
WGFP	: Western Ghats Forestry Project
WLS	: Wild Life Sanctuary

Glossary of local terms

Adivasi	: Tribal
Anabe (Anbi)	: Mushroom
Anganwadi	: Nursery school
Asthma	: Bronchitis
Ayurveda	: Traditional Indian Medicine
Balli	: Vine/climber
Beru	: Root
Betta land	: Forest Land allocated to areca garden owners for exclusive collection rights of leaf manure.
Bhagayat	: Spice garden
Butti and Chooli	: Cane basket and articles used in agriculture
Cane	: Rattan
Chabbe	: Small basket made from cane
Chatai	: Mat
Curry	: Dish
Dabu	: Rope for tying cattle
Dhoopa	: Resin used as incense
Devara Kadu	: Sacred grove
Dosa	: Pancake
Ele	: Leaves
Ganja	: Plant based drug
Gadde	:Tuber/Rhizome
Gomal	: Grazing Land
Goragu	: Traditional raincoat prepared from cane or bamboo
Gram Sabha	: General Body of Village
Gunte	: Cents (land), unit for measurement of land
Hannu	: Fruit
Jatra	: Local fair
Kanaja	: Grain storage bin
Karada	: Grass/ fodder
Kayi	: Unripe fruit
Kuski	: Dry Land
Lakh	: 1,00,000
Makara month	: Spring time
Maala	: Watch tower for watching wild animals in the agriculture land
Malnad	: Hilly area
Mankri	: A cane basket specially designed to be used in processing of arecanut.

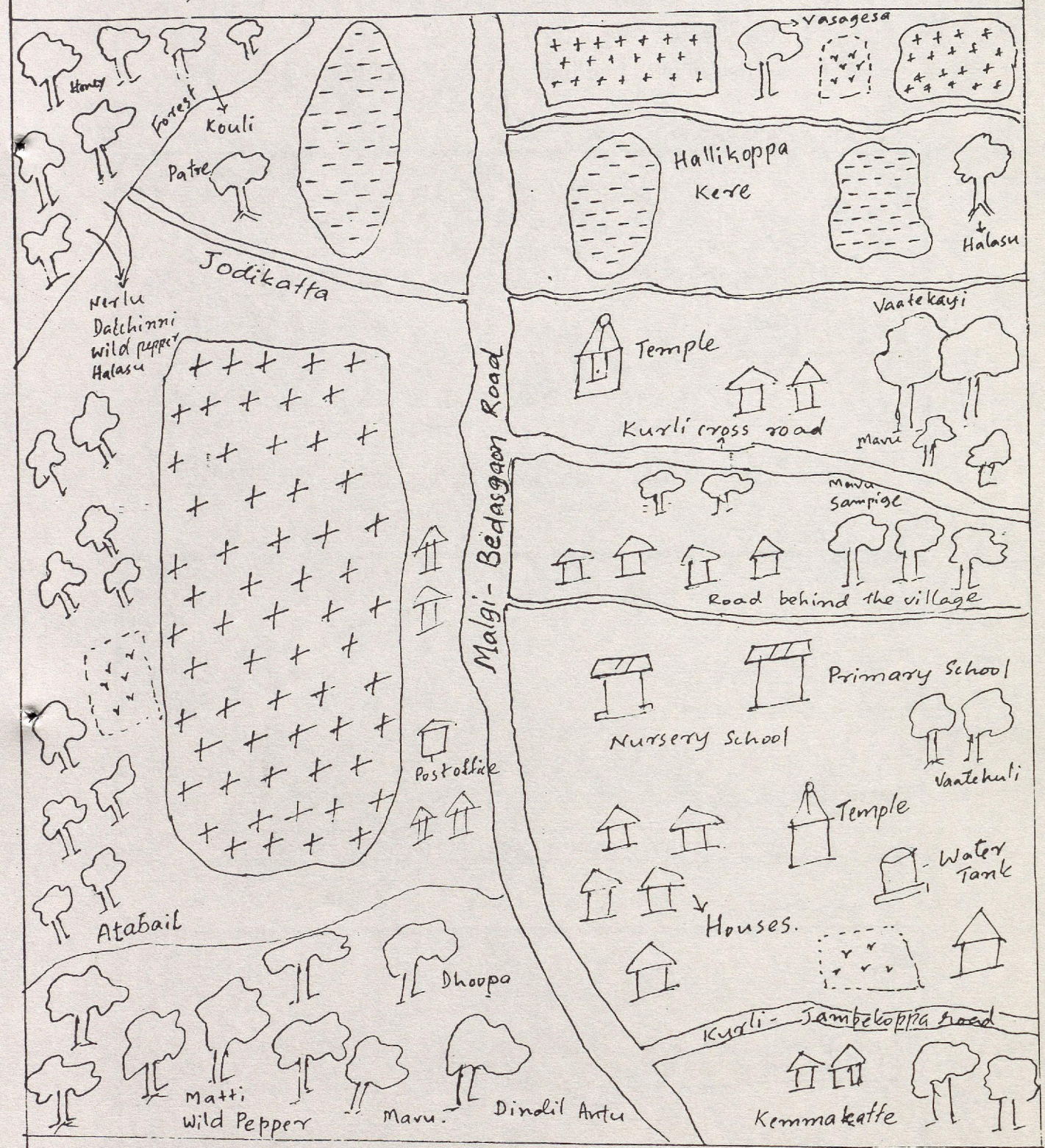
Moggu	: Bud
Moode	: A special bundle to store paddy made from hay
Negilu	: Plough
Nira	: Sap of palm
Noga	: Plough
Pade mara	: Host tree for rock bees
Pan	: Betel leaf
Panchayat	: Village level administrative unit
Pan-masala	: Chewing betel nut and spice
Papad	: Snack
Pooja	: Worship
Rabi	: Winter crop
Reserve Forest	: Government Forest
Sambar	: A kind of recipe used as an additive with rice
Senabu	: Jute
Shedule Areas	: Those areas declared as tribal areas in the Indian Constitution
Shedule Caste	: The community that has been classified as backward in the Indian Constitution.
Taluka(Tehsil)	: An administrative unit in the district
Tambuli	: A dish
Thari	: Dry Paddy Land
Toddy	: Sap from palm tree
Tottilu	: Cradle

ANNEXURES

Contents	
Annexure	**Title**
1	Resource map of Kurli village of Malgi cluster (PRA)
2	Historical (Time line) Transact of H.D.Kote cluster
3	Inflow outflow of NTFP resources in Anshi cluster
4	Transact walk in Achave cluster
5	Matrix ranking in Hosanagar cluster
6	Out turn of NTFP in Karnataka state
7	Out turn of NTFP in Forest circles of Western Ghats region
8	List of NTFPs available in Western Ghats of Karnataka
9	Questionnaire a. Household Survey b. NTFP's Types and Availability

Annexure 1.

Resource Map of Kurli Village of Malgi Cluster



Pond

Agriculture Land

Forest with NTFP species

Roads

Houses

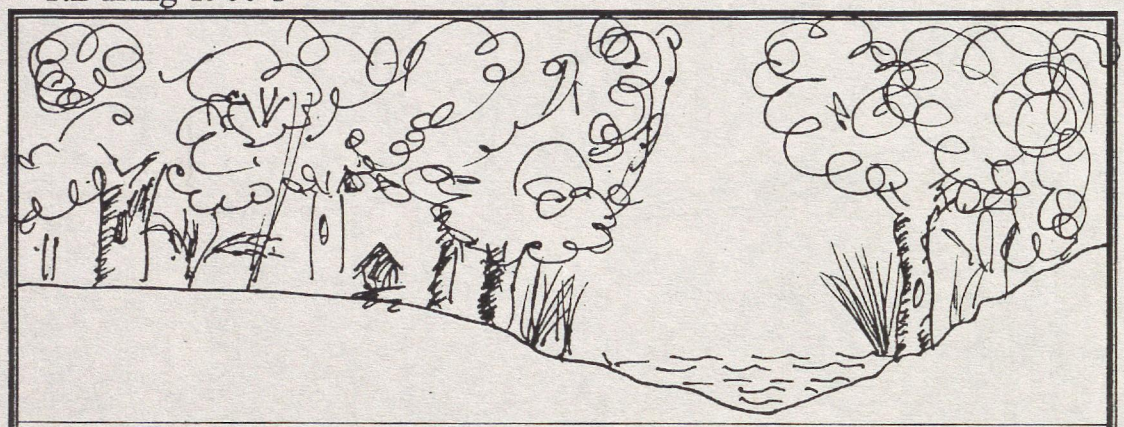
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Annexure 2

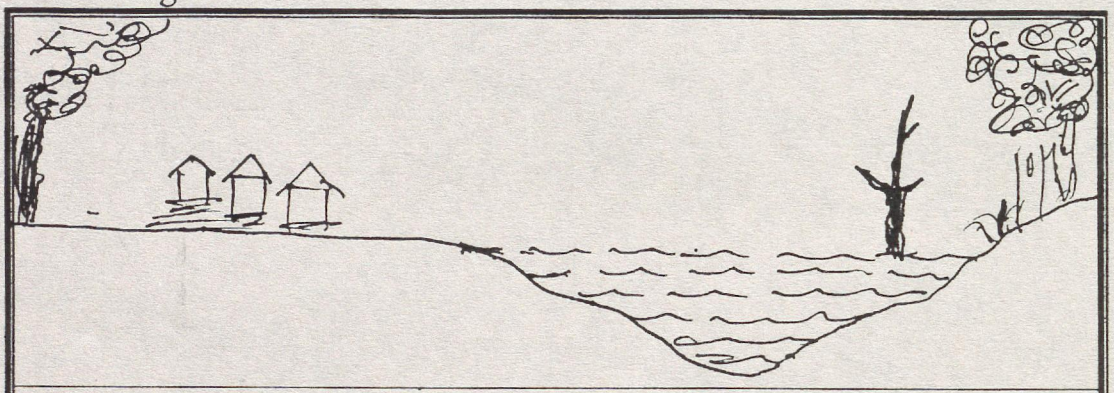
Historical (Time line) Transact of H.D.Kote Cluster (PRA)

1.During 1960's



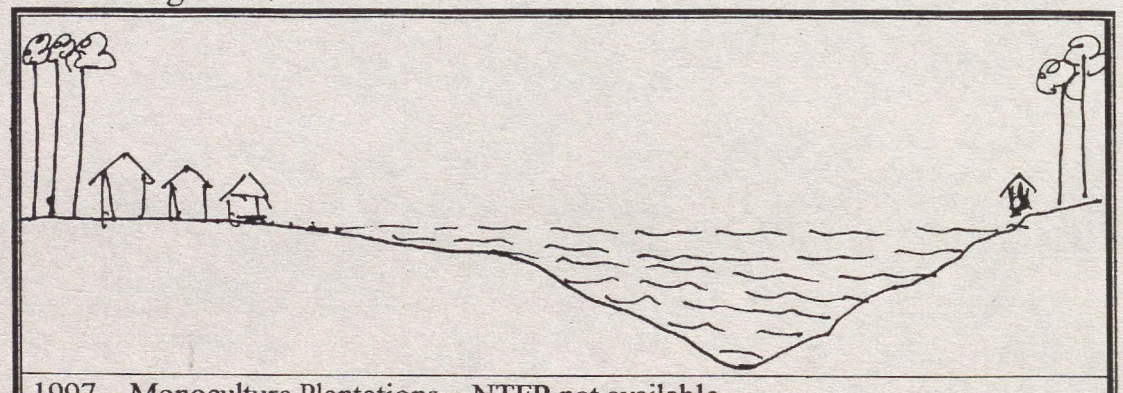
1960's: Thick Moist Deciduous forest with very few habitants, Abundance of NTFPs

2. During 1970's



1970's: Dam was built, forest cleared – Availability of NTFP reduced

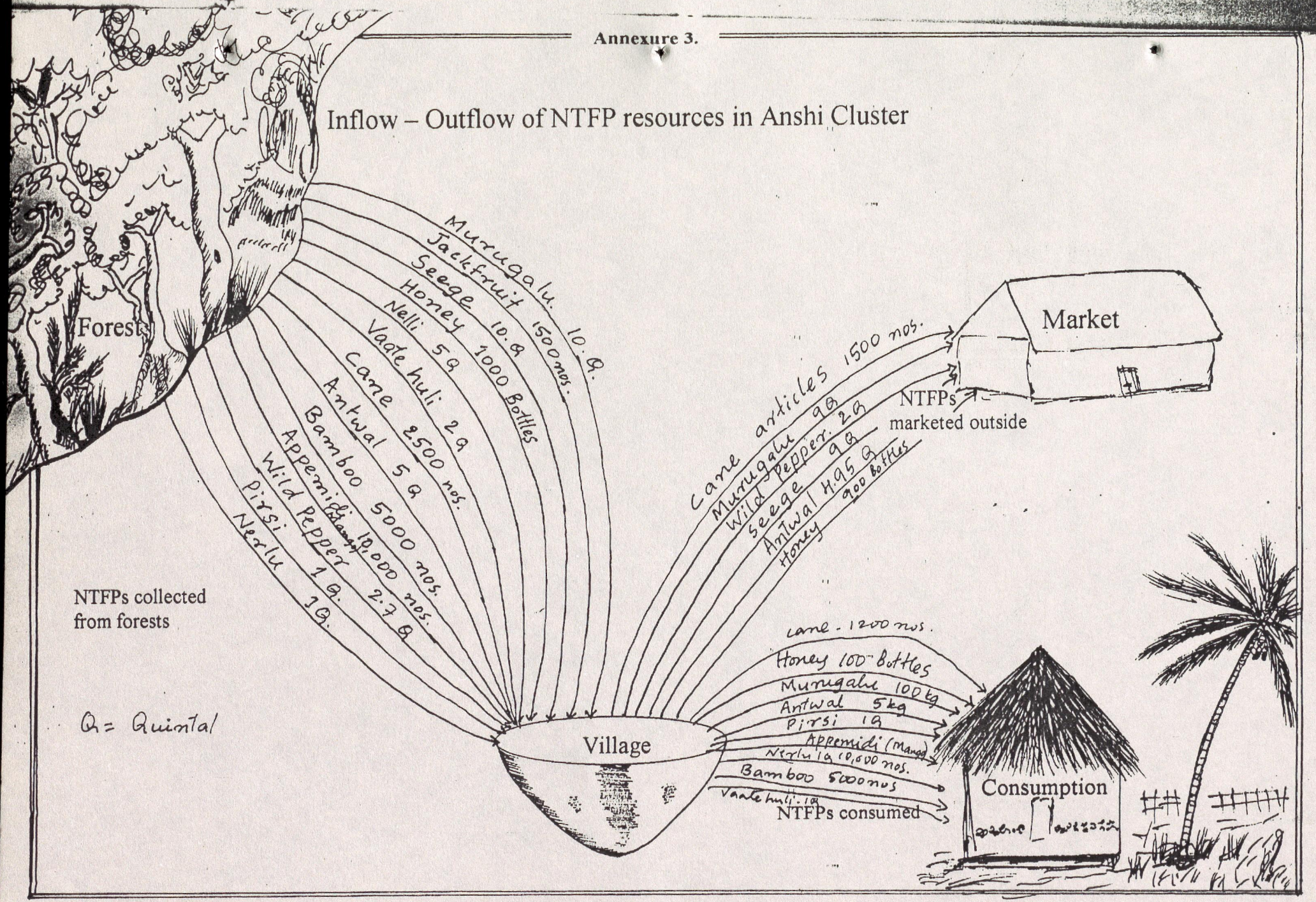
3. During 1997:



1997 – Monoculture Plantations – NTFP not available

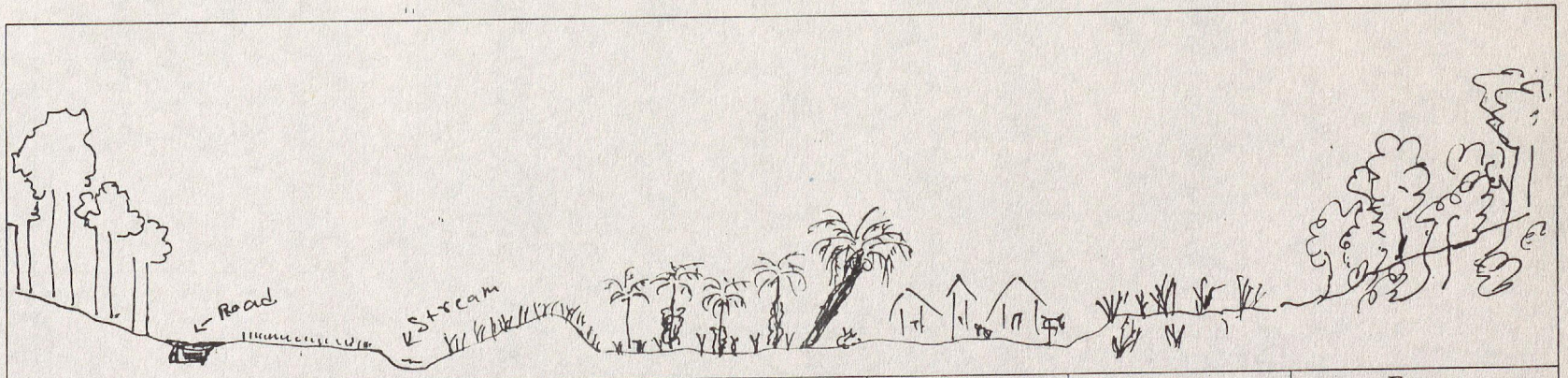
Refer: Page no. 94,
Redrawn from a diagram, December 98

Inflow – Outflow of NTFP resources in Anshi Cluster



Annexure 4.

Transact walk in Achave Cluster



	Teak Plantation	Field	Grass land	Areca garden	Settlement	Scrub	Forest
Resources	Teak *(Tectona grandis)*	Paddy (rainy season) Vegetables, millets in dry season	Fodder	Areca Cardamom Pepper Nutmeg and other spices	Home garden Vegetables	Wild fruits, Wild vegetables	Uppage, Rampatre Dalchinni…many NTFP species
Tenure	KFD	Private	Community	Private	Private	KFD	KFD
Vegetation type	Teak, Small patches of grass land	--	Grass	Mixed Spice Species With areca and coconut	Climbers, small bushy plants	Degraded scrub forest	Thick evergreen type of forest

Redrawn from original diagram, March, 98

Annexure 5.

Matrix Scoring and Time line of Importance of NTFP components In Hosanagara Cluster

(Redrawn from original diagram)

Dependency on forest around 1930

Services	Agriculture	Market	Forest
Vegetable	* * *	Nil	* * * * *
Medicine	*	Nil	* * * * *
Agriculture equipment	* *	Nil	* * * * *
Fiber	* * *	Nil	* * * *
Manure	* *	Nil	* * * * *
Bio-pesticide	*	Nil	* * * *
Cattle feed	* * * * *	Nil	* * *
Other products like soap, fruits Oil etc	*	* *	

Dependency on forest around 1970

Service	Agriculture	Market	Forest
Vegetable	* * *	* *	* * * *
Medicine	*	* *	* * *
Agriculture equipment	* *	* *	* * *
Fiber	* * *	*	* * *
Manure	* *	*	* * * *
Bio pesticide	Nil	* *	* *
Cattle feed	* * *	* *	* * *
Other products like soap, fruits Oil etc	*	* * *	* *

Present situation

Service	Agriculture	Market	Forest
Vegetable	*	* * * *	* *
Medicine	*	* * * * *	*
Agriculture equipment	*	* * * *	* *
Fiber	*	* * *	*
Manure	* *	* * * *	* *
Bio pesticide	Nil	* * * * *	Nil
Cattle feed	* * *	* * * * *	* *
Other products like soap, fruits Oil etc	*	* * * * *	*

February, 1999

Importance*

(* Number of stones put to represent the importance during PRA)

Annexure 6

OUT TURN OF NTFP IN KARNATAKA STATE

	PRODUCE	1993-94	1994-95	1995-96	1996-97	UNIT
1	BEEDI LEAVES	1081	1121	1379	520	Tones
2	OIL SEEDS	15	39	34	12	Tones
3	HONEY	36	39	48	24	Tones
4	WAX	3	108	16	2	Tones
5	TAMARIND	1671	1839	3517	911	Tones
6	SEEGEKAI	565	552	920	405	Tones
7	CASHEW	130	324	316	72	Tones
8	ALALEKAI	167	369	283	203	Tones
9	ANTWAL KAI	76	48	163	103	Tones
10	SPICES	234	236	153	325	M.T.
11	OTHER SEEDS	111	32	912	644	Tones
12	FRUITS	499	147	311	156	Tones
13	EUCALYPTUS IOL					Tones
14	FODDER GRASS	1478	1566	432	1608	Tones
15	ROSHA GRASS	241	242	2	2	Tones
16	GUMS	35	26	36	2	Tones
17	IVORY	196	429	1700	108	Tones
18	CHARCOAL	3	253	804	882	Tones
19	OTHERS	537	890	2512	540	Tones
20	ROSHA OIL	2000	1500	1	0	Kgs
21	ALAMADDI	4	0	0	100	Kgs
22	BARKS	235	131	113	0	Kgs
23	CANE	929570	841481	441980	229703	Nos

SOURCE:

Annual Administration Report (1996-97), Karnataka Forest Department.

Annexure 7.

OUT TURN OF NTFP IN FOREST CIRCLES OF WESTERN GHATS REGION FROM 1993-94 TO 1995-96

		********** 1993-94 **********								**********		
Produce	Unit	Bangalore	Belgaum	Bellary	Shimoga	Kanara	Kodagu	Mysore	Total	Bangalore	Belgaum	Bellary
CANES	Nos.	0	17000	0	0	854711	52284	5575	929570	0	55000	0
BEEDI LEAVES	Tonnes	502	11	448	116	4	0	0	1081	363	44	425
OIL SEEDS	Tonnes	0	9	6	0	0	0	0	15	0	32	6
HONEY	Tonnes	0	2	2	8	8	0	16	36	0	5	2
WAX	Tonnes	0	1	1	0	1	0	0	3	0	5	1
BARKS	Tonnes	0	0	3	0	0	232	0	235	0	121	0
TAMARIND	Tonnes	459	954	102	60	0	0	96	1671	857	800	73
SEEGEKAI	Tonnes	0	20	4	81	37	422	1	565	0	60	4
CASHEW	Tonnes	0	0	0	26	0	104	0	130	151	7	0
ALALEKAI	Tonnes	40	4	20	0	0	0	103	167	150	0	20
ANTWAL KAI	Tonnes	0	0	15	50	1	8	2	76	0	0	15
ALMADDI	KGS	0	0	0	1	3	0	0	4	0	0	0
SPICES	Tonnes	0	0	5	0	0	229	0	234	0	0	2
OTHER SEEDS	Tonnes	0	52	11	0	0	0	48	111	0	0	7
FRUITS	Tonnes	10	0	299	74	116	0	0	499	5	10	132
Eucalyptus oil	KGS	0	0	0	0	0	0	0	0	0	0	0
Rosha oil	KGS	0	2000	0	0	0	0	0	2000	0	1500	0
Fodder grass	KGS	0	2	1476	0	0	0	0	1478	0	10	1556
Rosha grass	KGS	0	1	240	0	0	0	0	241	0	1	241
GUM	KGS	0	29	6	0	0	0	0	35	0	13	7
IVORY	KGS	0	0	0	0	0	0	196	196	0	0	0
CHARCOAL		0	0	0	0	0	3	0	3	0	0	30
OTHERS		14	0	0	40	80	207	196	537	20	65	4
RUBBER										0	0	0

Source: Annual Administration Reports , 1993-94 to 1995-96, Karnataka Forest Department

Countonued .....

Annexure 7.

*** 1994- 95 **********				94-95	********** 1995-96 **********						
Shimoga	Kanara	Kodagu	Mysore	Total	Bangalore	Belgaum	Bellary	Shimoga	Kanara	Kodagu	Mysore
44279	644211	96055	1936	841481	0	0	0	53000	368980	0	20000
254	35	0	0	1121	565	28	609	174	3	0	0
1	0	0	0	39	0	27	0	1	0	0	8
5	11	1	15	39	10	2	1	8	13	1	13
3	2	0	97	108	6	0	1	5	4	0	0
4	0	6	0	131	0	50	19	1	0	43	0
57	0	0	52	1839	1629	1540	155	39	12	0	142
51	108	328	1	552	0	24	0	298	95	499	4
30	34	102	0	324	201	3	0	5	65	42	0
0	140	0	59	369	155	10	12	16	42	0	48
21	2	5	5	48	0	3	20	86	6	30	18
0	0	0	0	0	0	0	0	0	0	0	0
19	0	215	0	236	0	6	0	60	0	87	0
0	0	25	0	32	13	50	8	608	210	0	23
0	0	0	0	147	5	0	306	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1500	0	0	1	0	0	0	0
0	0	0	0	1566	0	6	25	0	0	1	400
0	0	0	0	242	0	2	0	0	0	0	0
0	0	0	6	26	0	25	10	0	0	0	1
0	0	0	429	429	0	0	0	0	0	0	1700
0	20	203	0	253	0	4	0	0	0	800	0
34	307	287	173	890	33	8	183	242	41	1050	955
0	0	5	0	5+3500.54	0					3	

Annexure 8.

List of NTFPs available in Western Ghats of Karnataka

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
1	Aadusoge	*Adhatoda vasica*	Vasaka	Leaves	Whole year	Medicine
2	Aal	*Ficus bengalensis*	Vatavruksha	Whole plant	Whole year	Medicine
3	Adchare	*Mymecylon edule*		Twigs	Whole year	Brooms
4	Agase	*Sesbania grandiflora*	Munidruma	Leaves	Whole year	Vegetable
5	Ajjalu	Not known		Leaves	Whole year	Fibre
6	Akka thangiyara gida	*Exaceum bicolor*		Whole plant	Whole year	Medicine
7	Akki genasu	Not known		Rhizome	Whole year	Vegetable
8	Amate	*Spondias pinnata*	Amrataka	Fruit	Nov- Jan	Wild Fruit
9	Ambekombu	*Curcuma amada*	Mango zinger	Tuber	Dry season	Additive with rice
10	Amruthballi	*Tinospora cordifolia*	Uganiballi, Guluchi	Whole plant	Monsoon	Herbal tea
11	Analekayi	*Terminalia chebula*	Alale, Harda, Haritaki	Fruit	Nov-March	Wild Fruit
12	Anjoora	*Ficus carica*	Seeme atti	Fruit	April-May	Wild Fruit
13	Ankole	*Alangium salvifolium*	Akola	Fruit	Monsoon	Wild Fruit
14	Antaragange	Pistia stratiotes	*Water soldier*	Whole plant	Whole year	Medicine
15	Antavala	*Sapindus emarginata*	Soapnut,	Seeds	Jan-Feb	Washing
16	Apattina Chakke	Not known		Bark	Whole year	Medicine
17	Appachchi balli	*Pothos scandens*		Climber	Whole year	Fodder
18	Appesoppu	Not known			Whole year	Fodder
19	Aramadlu	*Zanthoxylum ovalifolium*	Petla kayi	Fruit	May-June	Wild Fruit
20	Aranya jeeraka	*Centratherum enthelminticum*		Seeds	Whole year	Medicine
21	Arishina andi	*Garcinia morella*	Arishinadele	Seeds	April-May	Oil
22	Arishina balli	Not known			Whole year	Medicine
23	Ashoka	*Saraca indica*	Khari, Asok, Kenkalli	Bark	Whole year	Herbal tea
24	Ashwagandha	*Withania somnifera*			Whole year	Medicine
25	Ashwatha	*Ficus religiosa*	Peepul tree, Arali	Bark	Whole year	Herbal tea
26	Attambara soppu	*Vitis discolor*		Whole plant	Oct- Nov	Religious

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
27	Atti	*Ficus glomerata*	Oudumbara, Gulara	Leaves	Whole year	Tambli, curry, Fruit
28	Avugeri	Not known			Whole year	Fish poison
29	Bachale Soppu	*Boerhavia diffusa*	Punarnava	Leaves	Whole year	Vegetable
30	Badlige haralu	Not known		Seed, oil	Whole year	Medicine
31	Bage	*Albizia lebbeck*			Whole year	Medicine
32	Baine	*Caryota urens*	Sago, Toddy Palm	Whole plant	Dry Seaon	Wine, Food
33	Baje	*Zingiberaceae family*	Baji	Tuber	Whole year	Spice
34	Bakula	*Mimusops elangi*	Ranjalu	Fruit	April-May	Medicine
35	Balamuri	*Helicteres isora*			Whole year	Medicine
36	Bareballi	Not known			Whole year	Fiber
37	Barlasoppu	Not known			Whole year	Medicine
38	Bekkenatalegida	*Sida veronicifolia*	Bananiyar	Leaves	Whole year	Tambli, curry
39	Bennekundige	*Costus specious*	Artikundige	Leaves,Rhizome	Dec-Jan	Tambli,Medicine
40	Betta baage	*Albizzia clinesis*	Shireeshabedha	Whole plant	Whole year	Medicine
41	Bhadra musthi	*Cyperus rotundus*		Whole plant	Whole year	Medicine
42	Bharangi	*Clerodendron serratum*	Kirutega	Roots	Whole year	Medicine
43	Bhoosakregadde	*Ipomea digitata*	Vidareekanda	Tuber	Dry Season	Medicine
44	Bhootale	*Sterculia urens*	Kodaya	Leaves	Whole year	Fiber,Medicine
45	Bhore	*Ziziphus mauritiana*	Egachi, Karkamadhu	Fruit	Whole year	Wild Fruit
46	Bigana soppu	Not known			Whole year	Fish poison
47	Bikke	*Gardenia gummifera*	Dikkamali, Naadihing	Fruit	July-Oct	Wild Fruit
48	Bile mandara	*Banhinia auminata*	Bile Kanchuvala	Leaves, Bark	Whole year	Medicine
49	Bili basari	*Ficus amplissima*		Bark	Whole year	Medicine
50	Bilimatthi	*Terminalia arjuna*		Bark	Whole year	Manure, Medicine
51	Bilimullehannu	*Zyzypus rugosa*	Suran, Kottehannu	Fruit	March-May	Wild Fruit
52	Bilipashanabedha	*Aerva lantana*	Bhadrika	Whole plant	Whole year	Medicine
53	Bilirasa	Not known			Whole year	Fibre
54	Bilva Patre	*Aegle marmelos*	Bel, Bengal, Khaira	Leaves	Whole year	Tambli

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
55	Bobby	*Callophyllum tomentosum*			Whole year	Medicine
56	Bringaraj	*Eclipta alba*	Garugalu	Leaves	Whole year	Medicine
57	Buralu	*Bombax malabaricum*			Whole year	Cotton
58	Chakramani	*Sauropus androgynus*	Surasarumi	Leaves	June-July	Medicine
59	Chalanakayi	Not known			Whole year	Vegetable
60	Challe	*Cordia myxa*	Shelvant, Bahuvaraka	Fruit	June- August	Wild Fruit
61	Champa	*Michelia champaca*	Sampige	Flowers	Dry season	Perfume
62	Chandakalu	*Macaranga peltata*	Uppale	Resin	Whole year	Medicine
63	Chandige	*Kalanchoe integra*	Parna beeja, Kenjige	Whole plant	Whole year	Tambli
64	Characharakonde	Not known		Rhizome	Whole year	Medicine
65	Chinwa bamboo	*Oxytenanthera monostigma*	Bidiru	Whole plant	Whole year	Agriculture use
66	Dalchinni	*Cinnamomum zeylanicum*	Cinnamon	Bud, Bark	Feb-March	Spice
67	Dasavala	Not known	Kepalu	Fruit	Jan-July	Wild Fruit
68	Dattura	*Argemone mexicana*	Swarnaksheeri	Whole plant	Whole year	Medicine
69	Datura	*Datura indica*	Ummatha	Leaves	Whole year	Medicine
70	Devadhari	*Erythroxylum monogynum*		Leaves	Whole year	Medicine
71	Dharbe	*Desmostachya bipinnata*		Leaves	Whole year	Religious
72	Dhoopa	*Boswellia serrata*	Vishesha dhoopa	Resin	Dry Season	Commercial
73	Dindal	*Anogeissus latifolia*			Whole year	Medicine
74	Dodda challe	*Cordia tomentosa*	Shleshmataka	Fruit	Whole year	Wild Fruit
75	Dodda hasarane ball	*Merremia hastata*		Whole plant	Whole year	Medicine
76	Dodda nekkarike	*Melastoma malabathrium*	Ankerki, Phulki	Leaves	Whole year	Tambli, Sambar
77	Doddaneggilu	*Pedalium murex*	Shrungatika	Whole plant	Whole year	medicine
78	Doddipatre	*Coleus aromaticus*	Parnayavani	Whole plant	Whole year	Curry
79	Doopandige kudi	Not known		Leaves	Whole year	Religious
80	Doorva	*Cynodon dactylon*	Garike, rasallaki	Whole plant	Whole year	Herbal tea
81	Eeshvari balli	*Aristolchia indica*			Whole year	Medicine

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
82	Ekanayaka	*Esculenta eucifera*	Mehari, Saptakapi	Fruit	Whole year	Wild Fruit
83	Ekke	*Calotropis gigantea*	Vasuka	Leaves,Bark	Whole year	Medicine
84	Elavarige	*Cassia sophera*	Kaasamarda	Leaves	Whole year	Tambli, Khatne
85	Female bamboo	*Bambusa arundinacea*			Whole year	Agriculture use
86	Gadde karande	*Sphacranthus indicus*		Whole plant	Whole year	Medicine
87	Gajakarna	*Adianthum candatum*		Seeds	Whole year	Medicine
88	Ganapekayi	*Entada phaseoloides*	Hallekayi, Pallekayi	Fruit	Whole year	Curry
89	Gandhasur	Not known			Whole year	Medicine
90	Gangammana balli	Not known	Jyostishmati	Whole plant	Whole year	Hebal tea
91	Garudapathala	Not known		Whole plant	Whole year	Medicine
92	Gaverittekayi	Not known	Gavaldekayi	Fruit	Whole year	Sambar, Curry
93	Ginalu balli	Not known			Whole year	Fiber
94	Gojjal	*Lannea coromandelica*			Whole year	Agriculture use
95	Gojjalu	*Lannea loromandelica*	Ajasringi	Tender leaves	Whole year	Vegetable, Medicine
96	Gonisoppu	*Portulaca quadrifida*	Genigida	Whole plant	Whole year	Tambuli, Chutney
97	Gove haralu	*Jatropha curcas*	Danti bedha	Leaves, bark	Whole year	Medicine
98	Gowrihu	*Gloriosa superba*			August-Sept	Religious
99	Gudda pannerlu	*Syzigium zeylanium*	Meghamadini	Fruit	Whole year	Wild Fruit
100	Gudde tumbe	*Leucus lavendulaefolia*	Drona pushpa	Whole plant	Whole year	Medicine
101	Guddegeru	*Semecarpus anacardium*	Keru, Marking nut	Fruit,	Dec-Jan	Food, Oil seeds
102	Guddemallige balli	Not known			Whole year	Fiber
103	Gulamavu	*Machilus macrantha*	Kulir mavu	Bark	Whole year	Medicine
104	Gurige	Not known			Whole year	Foder
105	Gurmatla	Not known		fruit	Whole year	Wild Fruit
106	Gyaralaballi	Not known			Whole year	Vegetable
107	Haademanni	*Cyclea burmunni*	Rajapathaka	Leaves	whole year	Additive with rice
108	Halasu	*Artocarpus heterophyllus*	Panasa, Kathal	Fruit	March-Sept	Papad, Chips
109	Halige	*Coccina indica*		Fruit	Oct-Nov	Wild Fruit

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
110	Halivana	*Not known*			Whole year	Medicine
111	Halivaru	Not known			Whole year	Fibre
112	Halu bettha	*Calamus pseudotenuis*	Cane		Whole year	Handicrafts, Fiber
113	Halu genasu	Not known		Rhizome	Whole year	Vegetable
114	Handi bettha	*Calamus thwaltessi*	Cane	Whole plant	Whole year	Handicrafts, Fiber
115	Hebbalasu	*Atocarpus hirsuta*	Jungle jack tree	Fruit	May-June	Wild Fruit
116	Hedahagala	*Myristica spp.*		Fruit	Whole year	Spice
117	Heddumbe	*Lobilea nicotonifolius*			Whole year	Bio-Pesticide
118	Heggenasu	*Dioscorea bulbifera*	Potato yam	Tuber	Dry Season	Sambaar
119	Hippali	*Piper longum*		Seeds	Whole year	Spice
120	Hittande	*Eurio caulon*		Whole plant	Dec-Jan	Handicraft
121	Hodikeballi	Not known			Whole year	Fiber
122	Hole Matthi	*Terminalia alata*		Bark, Leaves	Whole year	Medicine
123	Hole tumbe	*Crataeva religiosa*		Leaves	Whole year	Medicine
124	Holedasavala	*Lagerstroemia reginae*	Kramuka	Whole plant	Whole year	Tambli
125	Holetumri	*Diospyros malabarica*	Tinduka	Bark,Leaves	Whole year	Medicine
126	Hommugulu	*Spilanthus calva*	Akra	Flowers	Whole year	Medicine
127	Honagenne soppu	*Achyranthes triandra*	Paraga pattur	Leaves	Whole year	Tambli, Curry
128	Honey	*Apis spp*	Jenu, Madhu, Shahad		Whole year	Edible
129	Honge	*Pongamia pinnata*			Whole year	Medicine
130	Honne	*Pterocarpus marsupium*	Maha kutaja	Leaves, Bark	Whole year	Cattle Feed, Medicin
131	Huligowri	*Hibiscus furcatus*	Kiasi	Leaves	Whole year	Vegetable
132	Hulimajigge hannu	Not known		Fruit	August-Sept	Wild Fruit
133	Hulisoppu	*Oxalis corniculata*	Pullampurachi	Whole plant	Whole year	Additive with rice
134	Huriyakki	Not known			Whole year	Medicine
135	Ichalu	*Phoenix sylvestris*	Khanjur, Shindi, Wild	Fruit	May-July	Fruit, wine
136	Idli soppu	Not known			Whole year	Additive with rice

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
137	Ilikivi soppu	*Merremia tridentata*	Aakhuparni, Prasarini	Whole plant	Whole year	Tambli
138	Ippe	Madhuca indica	Mahua	Seeds	Whole year	Seed oil, Medicine
139	Itle	*Not known*		Leaves	Whole year	Vegetable
140	Jambe	Xylia xylocarpa		Seeds	Whole year	Edible
141	Jamun	*Zanthoxylum rhetsa*			Whole year	Wild fruit
142	Jeevanthi gida	*Flickingeria macraei*	Jeevanthee	Whole plant	Whole year	Medicine
143	Jiddi hullu	Not known			Whole year	Brooms
144	Jolige hannu	*Garcinia pictorius*	Jeerksina huli, deerksinahuli	Fruit	Jan-March	Fruit, Tumarind
145	Jummimara	*Fagaria budrunga*	Badranga	Fruit	Whole year	Spice, Pickle
146	Kaadu Adike	*Areca dicknoii*	Pandavara Adike	Fruit	Dec-Jan	Wild Fruit
147	Kaadu Arishina	*Curcuma zedoria*	Jangli haladi	Tuber	Dec-Jan	Health drink
148	Kaadu atti	*Ficus hispida*	Kakodumbara	Bark,Seed	Whole year	Medicine
149	Kaadu avare	Not known			Whole year	Vegetable
150	Kaadu hippe balli	*Piper peepuloides*			Whole year	Medicine
151	Kaadu Kadale	*Malva verticillata*	Kadlangade	Whole plant	Whole year	Tambli
152	Kaadu Shunti	*Zingiber zerumbet*	Vanadraka	Rhizome	Whole year	Medicine
153	Kachargadde	*Zingiberaceae family*		Tuber	Whole year	Vegetable
154	Kadu kanigalu	Not known	Nagakesara	Leaves	Whole year	Medicine
155	Kadu menasu	*Piper nigrum*	Kalimirch, mire, wild pepper	Fruit	Dec-Feb	Spice
156	Kadu pullampurchi	*Desmodium triflorum*		Whole plant	Whole year	Medicine
157	Kadu uttarane	*Stachyatarpeta jamaicensis*		Whole plant	Whole year	Medicine
158	Kadubaale	*Musa bulbisiana*	Vanakadali	Leaves	Whole year	Consumption
159	Kahibevu	*Azardirachta indica*	Nimba	Leaves	Whole year	Kashaya
160	Kakke	*Cassia fistula*	Suvarnaka, Indian labernum	Leaves	Whole year	Hasi, Medicine
161	Kalale	*Bambusa spp*	Bamboo shoot	Whole plant	Monsoon	Pickle, Sambar
162	Kaltulsi	Jthosiphon stami-neus	Mittee Tulsi	Leaves, Root	Whole year	Medicine
163	Kanagilu	*Dellinia pentagyna*		Leaves	Whole year	Fodder
164	Kangalaka	Not known			Whole year	Bio-Pesticide

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
165	Kanne kudi	Not known	Kannegida, Hiribasale	Leaves	Whole year	Khatne, Tambli
166	Kappe menasu	*Pepperomia pellucida*		Whole plant	Whole year	Spice
167	Kari basari	*Ficus tsjahela*	Plaksha	Bark	Whole year	Medicine
168	Karibevu	*Murraya koenigii*	Barsanga, Krishna pat	Leaves	Whole year	Flavouring agent
169	Karilakki	*Vitex trifolia*		Fruit	June-July	Food
170	Karpura	*Cinnamomum camphora*			Whole year	Religious
171	Kasarka	*Strychnos nuxvomica*	Kaatarike	Fruit,Leaves	Whole year	Bio-Pesticide
172	Kasturi bende	*Abelmoschus moschatus*		seeds	Whole year	Medicine
173	Kathale	*Agave americana*		Bark	Whole year	Fiber
174	Kattina maddu	Not known			Whole year	Bio-Pesticide
175	Kaulu balli	Not known		Bark	Whole year	Fiber
176	Kavalu	*Careya arborea*		Bark	Whole year	Fiber
177	Kayi genasu	Not known		Rhizome	Whole year	Vegetable
178	Kayinore soppu	Not known			Whole year	Bio-Pesticide
179	Kedage	*Pandanus tectorius*		Leaves	Whole year	Fiber
180	Keku	*Cyperus rotundus*		Leaves	Whole year	Brooms
181	Kempiberu	*Draceana terminalis*	Manidruma	Whole plant	Whole year	Medicine
182	Kesa	Not known		Leaves	Whole year	Curry, Karkli, Pathra
183	Khaira	*Acacia catechu*	Kaggali, Chadira	Bark	Whole year	Medicine,Katch
184	Khoolaballi	Not known		Climber	Whole year	Fiber
185	Kiranige	Not known			Whole year	Fodder
186	Kisukare	*Ixora coccinea*	Hole dasavala		Whole year	Medicine
187	Kodakane balli	Not known			Whole year	Fiber
188	Kodasa	*Holarrhena antidysenterica*	Kutaja	Leaves	Whole year	Food
189	Koralu balli	*Blepharis asperrima*	Kolike balli	Whole plant	Whole year	Medicine
190	Kotre balli	Not known			Whole year	Fiber
191	Kouli	*Carissa carandas*	Kabali, Karanda	Fruit	Whole year	Curry

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
192	Kudde Bhaji	Not known		Tuber	Whole year	Vegetable
193	Kumsada balli	Not known		Climber	Whole year	Fiber
194	Kuntanerlu	*Elaeocarpus lancifolius*	Guddanerale	Fruit	Whole year	Sambar
195	Kuppi gida	*Alalypha indica*	Harithamanjari	Whole plant	Whole year	Medicine
196	Lakki	*Vitex negundo*		Leaves	Whole year	Curry
197	Lambana hoovu	Allemanda cathar-tica	Ballikaraveera	Whole plant	Whole year	Medicine
198	Lavancha	*Vativeria zizanoides*			Whole year	Medicine
199	Lemon grass	*Cymbopogon citratus*			Whole year	Manure
200	Lingada hoo	Not known			Whole year	Religious
201	Lolesara	*Aloe vera*	Kumari	Whole plant	Whole year	Pickle, Chutney
202	Machipatre	*Artemesia indica*			Whole year	Spice
203	Madahaglu	*Momordica diosica*	Karchi balli, Janglikare	Fruit	Whole year	Bio-Pesticide
204	Madarangi	*Lawsonia inermis*	Henna, Mehandi.		Whole year	Decorative
205	Maddarasa	Not known			Whole year	Medicine
206	Maddiballi	Not known			Whole year	Fibre
207	Madhu nasha	*Gymnema sylvestre*		Leaves	Whole year	Medicine
208	Madivala soppu	Not known			Whole year	Additive with rice
209	Magali beru	*Decalepis hamiltonii*	Sariva	Root	Whole year	Medicine
210	Makari balli	Not known			Whole year	Fiber
211	Male bamboo	*Dendrocalamus strictus*	Kalale	Young shoot	April-May	Commercial, Food
212	Marabaale	*Saccolabium papillosum*	Vanda	Fruit	Monsoon	Sambaar
213	Maragaja	Not known	Tree moss, Kallu pase	Whole plant	Whole year	Commercial
214	Maragenasu	*Manihot esculenta*		Tuber	Whole year	Vegetable
215	Marakesa	Not known		Leaves	Whole year	Tambli
216	Masalegende	Not known			Whole year	Additive with rice
217	Mathi	*Terminalia tomentosa*			Whole year	Medicine, Fodder
218	Mavu	*Mangifera indica*	Mango, Aam, Amba	Fruit	March-Aug	Consumption
219	Mayanaballi	Not known			Whole year	Fibre

S.No	Local Name	Botanical Name	Other names	Parts used	Season	Type of use
220	Meenangi	Not known		Leaves	Whole Year	Fish poison
221	Merda	Not known		Whole Plant	Whole Year	Medicine
222	Mitle	Not known		Leaves	Whole Year	Medicine
223	Masale soppu	Not known		Leaves	Whole Year	Vegetable
224	Mukkadaka	*Lasiosiphon eriocephalus*	Rammana soppu	Leaves	Whole Year	Bio-Pesticide
225	Mullu harive	*Amaranthus spinosus*		Whole Plant	Whole Year	Vegetable
226	Mullu muttuga	*Erithrina indica*			Whole Year	Medicine
227	Mullumuthala	*Polystachya sophaga*	Aphanamixes	Seeds	Whole Year	Seed oil
228	Murugalu	*Garcina indica*	Kokum, Amsola	Fruit, Seed	Whole Year	Tambli
229	Mushrooms	*Agaricus compestris*	Anabe, Anabu	Whole Plant	Whole Year	Pickle
230	Muthuga	*Butea monosperma*	Palasha	Leaves	Arpil-June	Medicine
231	Naaga gorate	*Justicia species*			Whole Year	Medicine
232	Naagamallige	*Rhinacanthus communis*	Yootha Pushti	Whole Plant	Whole Year	Medicine
233	Nachike gida	*Mimosa pudica*	Lajjawanti, Lajjamach	Whole Plant	Whole Year	Sambaar
234	Naga betha	*Calamus rotang*	Cane		Whole Year	Handicraft
235	Nagasampige	*Mesua ferrea*		Flowers	Whole Year	Religious
236	Naga genasu	Not known		Rhizome	Whole Year	Vegetable
237	Nasugunni	*Mucuna atropurpurea*		Seeds	Whole Year	Medicine
238	Nayivaate	Not known		Whole Plant	Whole Year	Medicine
239	Navalachi	*Vitex peduncularis*	Nagpheri	Leaves	Whole Year	Medicine
240	Navaregadde	Not known		Rhizome	Whole Year	Vegetable
241	Navilugadde	Not known		Tuber	Whole Year	Vegetable
242	Neer Brahmi	*Bacopa monneri*	Brahmi	Whole Plant	Whole Year	Medicine
243	Neeratti	Not known		Fruit	Whole Year	Medicine
244	Nelabevu	*Swertia chirata*	Chiretta, Kiratatikta	Whole Plant	Whole Year	Medicine
245	Nelagonagalu	*Elephantos scabre*	Gojiuva		Whole Year	Medicine
246	Nelakanchi	*Naregamia alata*	Nelanimbe	Leaves	Whole Year	Medicine

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
247	Nelanekkarane	*Souropus androgynus*	Kshetra parpata	root	Whole year	Medicine
248	Nelanelli	*Phyllanthus asperulatus*	Kirunelli, Bhoodatri	Whole plant	Whole year	Medicine
249	Nelli	*Emblica officinalis*	Amla, amalaka	Fruit	Whole year	Spice
250	Nerlu	*Syzigium cumini*	Jambu, Jaman	Fruit	Whole year	Wild Fruit
251	Norale balli	Not known			Whole year	Fibre
252	Noregenasu	*Dioscorea pentaphylla*	Kenta alu	Tuber	Whole year	Vegetable
253	Nurkalu	*Buchanania lanzan*	Chironji, Cuddapah al	Fruit	Whole year	Wild Fruit
254	Ondelaga	*Centella asiatica*	Brahmi, Manduka par	Whole plant	Whole year	Medicine
255	Oralegida	*Desmodium gangetieum*	Ondelehonne		Whole year	Medicine
256	Paragi	*Zyzyphus oenoplia*	Kari mullehannu	Fruit	March-April	Wild Fruit
257	Parangi patre	Not known			Whole year	Fibre
258	Parijatha	*Nyctanthes arbor-tristis*			Whole year	Medicine
259	Pashana bedhi	*Aerva lanata*		Whole plant	Whole year	Medicine
260	Patpate	*Bryophyllum calycinum*			Whole year	Medicine
261	Pirshi	Not known			Whole year	Additive with rice
262	Pudina	*Mentha arvensis*	Japenese mint	Leaves	Whole year	Medicine
263	Pundi	Not known			Whole year	Fiber
264	Putranjivi	*Putranjiva roxburghii*			Whole year	Medicine
265	Ragadi	*Not known*			Whole year	Fibre
266	Rampatre	*Myristica malbarica*	Malbaar nutmeg	Fruit	Feb-April	Commercial
267	Ranginamara	*Morinda citrifolia*	Bannaa gida	Kaadu seethapal	Whole year	Medicine
268	Ranjalu	*Mimusops elengi*	Bakula, Pagade	Fruit	Whole year	Wild Fruit
269	Sagadi	*Schleichera oleosa*			Whole year	Medicine
270	Saldhupa	*Vateria indica*		Resin	Whole year	Commercial
271	Sampige hannu	Not known		Fruit	Whole year	Wild Fruit
272	Sanduballi	*Cissus quadrangularis*	Asthishrunkhala	Whole plant	Whole year	Medicine
273	Sanna neggilu	*Tribulus terrestris*	Gokshura	Whole plant	Whole year	Medicine

S.No	Local name	Botanical Name	Other names	Parts used	Season	Type of use
274	Sannakki soppu	Not known		Leaves	Whole year	Additive with rice
275	Saptaparni	Alstonia scholaris			Whole year	Medicine
276	Sarpangandhi	Rauvolfia serpentina			Feb-March	Medicine
277	Seege	Acacia concinna	Kochi	Pods	Jan-March	Washing
278	Shatavaari	Asparagus racemosus	Shatamooli, Majjigega	Root	Nov-Feb	Medicine
279	Shave	Oxytenanthera stocksil			Whole year	Additive with rice
280	Shingar balli	Not known			Whole year	Fiber
281	Shivane	*Gmelina arborea*	Gopabhadra, Gamari	Leaves	Whole year	Medicine
282	Shreegandha	*Santalum album*	Sandalwood, Chandan	Leaves	Whole year	Religious
283	Sugandhi balli	*Hemidesmus indicus*	Sogadeberu	Root	Whole year	Medicine
284	Surahonne	*Callophyllum inophyllum*		Leaves	Whole year	Medicine
285	Surgi	*Ochracarpus longifolis*	Punnaga Vundi	Flowers	Whole year	Religious
286	Suvarnagadde	*Amorphophallus campanulatus*		Tubers	Whole year	Vegetable
287	Taari	*Terminalia bellerica*	Shantimara, Gotinga	Fruit	Dry season	Beedi making
288	Tadasalu	*Grewia tillifolia*	Dhanwana	Leaves, Bark	Whole year	Medicine
289	Tagate	*Cassia tora*	Tagache, Chakate	Whole Plant	June-July	Additive with rice
290	Taggi	*Clerodendrum infortunatum*			Whole year	Medicine
291	Tavare	*Mymphea nonchali*		Seeds	Whole year	Medicine
292	Thagasu	Not known			Whole year	Brooms
293	Togarthee	*Allophyllus rheedii*	Triparni		Whole year	Medicine
294	Torangalu	Not known			Whole year	Decoction
295	Torate	*Hydnocarpus laurifolia*			March-April	Food (sour)
296	Tulsi	*Ocimum sanctum*	Patra Pushpa	Leaves	Dry season	Medicine
297	Tumri leaves	*Diospyros tupru*	Tupra, Beedi ele	Leaves	Dry season	Smoking
298	Ugare balli	Not known			Whole year	Fibre
299	Uppage	*Garcinia gummi-gatta*	Mantapuli, Uppangi	Fruit, seed	Whole year	Commercial

Annexure 9a

HOUSEHOLD SURVEY

Name of head in family:

Village: Panchayat: Taluk:

Caste: Religion: Cluster:

1) Total family members:

- Male :
- Female :
- Children

2) Details about family members:

S.No.	Name	Age	Relation with	Education	Income

2) Income from agriculture:

S. No	Crops	Area	Yield	Expenditure	Total income	Type of cultivation.

3) Occupation other than agriculture:

S. No.	Occupation	Earnings	Annual income

4) Possession of gadgets:
   1) Vehicles: Cycle/ Motor Cycle/F
   2) Entertainment: Radio/Tape Recorder/ T.V.
   3) Fuel Saving Machines: Gobar Gas/ Solar/ Astra ole
   4) Electrical Facilities: L.T./ A.E.H./Commercial
   5) Electrical Goods: Iron Box/Mixer/ Grinder/Washing Machine Etc

5) Type Of House:
   1) Roofing; Grass/ Areca leaves/ Mangalore Tiles/ R.C.C.
   2) Area Of House:
   3) Type Of Floor: Mud/Cement(Red Oxide)/ Tiles

6) Transportation Facility:
   1) Status of Road Mud/ Khadi/Tar
   2) Distance To Be Covered For Main Road/ Bus:

7) Are there any loans? If so where? How much?

8) Employment calendar family members for whole year

S.No.	Name of working members	No of days for agriculture	Wage earning	NTFP collection	Other work	No employment

9) Animal husbsbandary:

S.No	Total Cattle	Hybrid	Buffaloes	Local Variety	Fodder	Yield	Consumption

Annexure 9 b

NTFPs – Types and Availability

Name :

Village:

Type of Forest:

Status of forest:

1) Information about the NTFPs available:

S.No.	*Name Of N.T.F.P.*	*Quantity Available*	*Parts Used*	*Uses*	*Month Of Harvesting*	*Type Of Ntfp 1)Commercial 2)Consumption 3)Medicine*

2) Commercial NTFPs:

S.No	Name Of N.T.F.P.	Quantity Collected	Price	Purchaser	Total Income

3)Consumption NTFPs:

S.No	Name	Quantity required for house	Quantity available	Equivalent market price	Quantity used last year

4) Medicinal NTFPs

S.No.	Name of NTFP	Parts used	Quantity used	Annual require ment	Quantity available in this area	Uses

5) NTFPs collected last year:

S.No.	Name	Quantity collected	Price	Total income	Manpower used in collection	Market 1)Contractor 2)Agent 3)Smuggler 4)Local dealer