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***CONTRIBUTION OF NON-TIMBER FOREST
PRODUCTS (NTFPS) TO STATE ECONOMY:
A CASE STUDY OF KARNATAKA***

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**CONTRIBUTION OF NON-TIMBER FOREST PRODUCTS (NTFPS) TO STATE ECONOMY:
A CASE STUDY OF KARNATAKA**

Forests provide wide range of goods and services, which have significant economic value. These include fertile soil and wood, non-timber products, recreation, landscape value and a wide range of environmental benefits such as climate regulation, watershed protection and the conservation of biodiversity. The national accounts statistics include the monetary value of only a small fraction of the total economic value of forests (e.g. timber, recorded NTFPs and firewood). Inclusion of other benefits would reflect the total quantum of contribution of forests. Presently, the officially extracted Non-timber Forest Products (NTFPs) are only included in the estimation of the state domestic product (SDP). The value of NTFPs collected by the local population which is unrecorded is not included in the estimation of SDP. The paper tries to estimate the value of non-timber forest products (NTFPs) collected by the local people across different types of forests in Karnataka. It shows that on an average 55 per cent of households who are living in the vicinity of forest, collect these products. The average estimated value of NTFPs collected by households is Rs.7427 per household during the year 2012-13. The value of NTFPs collected by households varies from Rs. 16970 in Tropical Thorn forest to Rs. 3762 in Evergreen forest per hectare. The total estimated value of NTFP collected by the local people (unrecorded) is Rs. 2044 crores which is more than 20 times higher than recorded value of NTFPs in Karnataka.

1. INTRODUCTION

NTFPs are the biological materials other than wood, which are extracted from natural forests for human use. These products are usually extracted with simple, traditional techniques causing little damage on ecosystems. Forests provide wide range of goods and services, which have significant economic value. These include fertile soil and wood, non-timber products (NTFPs), recreation, landscape value and a wide range of environmental benefits such as climate regulation, watershed protection and the conservation of biodiversity. Though they are providing many benefits and services to the survival of the human beings, they have been depleted in terms of area and productivity. Depletion of forests in terms of transfer of forest land to other land uses and illegal cutting, etc are mainly because of underestimation of benefits of forests. Therefore, forest resources needs to be valued for better management and protection of forests. This would lead to optimum resource allocation for forest sector which is currently getting lower budgetary allocation.

Forests play very important role in the socio-economic development of the state by providing timber, firewood and NTFPs. These NTFPs provide sustenance to the rural and tribal people, who collect a large part of their daily necessities, including food and medicines, from the forests. Most of these products represent a direct subsidy to the rural poor, and constitute an integral element of the factors alleviating their poverty. For landless and marginal farmers living in the vicinity of forests, forest-related activities generate their primary source of income. In Karnataka, collection of non-timber forest produce is being entrusted to Tribal Societies wherever these exist. There are 19 such Tribal Societies in Karnataka. Wherever the societies do not exist the leases for NTFP collection are granted through tender-cum-auction sales. There are about 70 to 80 various NTFPs available in Karnataka. The major NTFPs collected in Karnataka are; *Beedi leaves, Honey, Wax, Tamarind, Seegekai, Cashew nut, Alalekai, Antwalkai, Fruits, Rosha Grass, Gum, Halmaddi, Nellikai, Ivory, Muruganahuli, Amsole, Vatehuli, Ramapatra,*

Uppigehuli, and others. The value of these officially extracted NTFPs is about Rs.100 crore during the year 2012-13. Apart from these officially collected NTFPs, the local people who live in the vicinity of the forest collect variety of NTFPs. These NTFPs collected by rural and tribal people are not included in the contributions of the forests to the state economy. Failure to take these resources into account means not only neglecting a considerable source of wealth, but also prevents optimal resource allocation. Estimation of total value of NTFPs help in understanding the magnitude and importance of NTFPs in the economy of Karnataka. In this context, the present paper attempts to estimate the value of NTFPs that are collected by local people in Karnataka. The paper is organized as follows: Section 1 gives introduction, section 2 presents literature review on valuation of NTFPs, in section 3 the sampling and methodology employed in the study are discussed. The findings of the study are discussed in section 4. The last section presents the concluding observations.

2. LITERATURE REVIEW ON VALUATION OF NTFPS

The studies dealing with the valuation of NTFPs are presented in tabular format for better understanding about the main objectives, methods and findings of various studies (table 1). The strengths and weaknesses of the Valuation Methods used in some studies are also presented in table 2.

Table 1
Studies on Valuation of NTFPs

Study (Year)	Methodology	Findings
1. Lal (1990)	Used market prices to value NTFPs available in India.	Value of wood Rs.118.8 billion per year. Fodder Rs. 22 billion per year. Other NTFPs Rs. 10.9 billion per year.
2. Chopra (1993)	Estimated the value of NTFPs for tropical deciduous forests in India. Used various valuation techniques to estimate the value of NTFPs. Following methods are used for valuation. Fuel wood: substitute good approach (price of soft coke) and labour input-cost of time spent in collection. Fodder: Market value of fertilizer and milk output from cattle feeding on established pasture and scrubland. Other forest products: Labour inputs –cost of time spent in collection.	The direct use value is US\$220 per hectare per year.
3. Gunatilake & Others (1993)	Study area: Knuckles National Wilderness Area in the Kandy and Mat ale districts of Sri Lanka. Direct use values of NTFPs are calculated excluding illegal extraction of wildlife, poles and ratten or products collected irregularly. Market prices of products or prices of close substitutes are used to value the NTFPs.	NTFPs provided 16.2 % and 5.3 % of total and cash income of the household per year. The value of NTFP extraction is US\$92 per hectare per year.
4. Howard (1995)	Valuation of NTFPs is under taken as a part of financial and economic CBA with regard to Uganda’s protected area system.	Direct use of wood and NTFPs by local communities is estimated at about US\$74 million per year.
5. Lescuyer & Guillaume (1996)	An attempt has been made to estimate monetary valuation of all nutritious NTFP extracted by a rural village population in the East Cameroon. Three economic valuation techniques have been used for NTFPs, i.e., local market prices, the market price of the substitute of the non-marketed NTFP, and NTFP value by knowing the time spent in forest for its collect by the	The value of NTFP extractions in Goute is FF 17945 for one year.

	gatherer. Market price method and market substitute's method have produced results. But their application and results are questionable.	
6.Emerton& Mogaka (1996)	Used participatory method for valuation of forest resources in Aberdares, in Kenya. They used pictures to value forest use.	By using this method, timber, medicines, honey, building materials, wild foods, and hunting, grazing, charcoal, fuel wood are valued. This exercise demonstrates how it is possible to link local categories of value and find a common 'currency' which can bridge the gaps between commercial and subsistence activities.
7.Chopra & Kadekodi (1997)	Estimated value of NTFPs based on the market price in two representative watersheds of the Yamuna river basin.	Value of NTFPs found quite high when compared to timber output.
8. Adger, et al (2002)	Estimates value of NTFPs in Mexico. These estimates are based on the shadow prices.	It is found that the use value of NTFPs is likely to be relatively high compared to other values, and possibly very high in certain regions.

Table 2

Strengths and Weaknesses of the Valuation Methods

Valuation Method	Strengths	Weaknesses
Local market Price method	The resulting value estimates are derived from true household choices, facing prices that are 'real'. They reflect local demand and supply conditions.	Prices vary widely according to the place. Market transaction takes place in an oligopoly contest and not in pure perfect competition. NTFP economic value is diminished because it is the price of the first transaction that is chosen for the valuation. In general, the valuator is free to set the price. Product prices also vary according to the season. Often, the valuation use a low price set when supply exceeds demand. This choice is arbitrary and indicates a minimal or conservative NTFP value is sought. Application of this valuation technique implies a preliminary choice of the valuator as to the level of value he wants to set.
Valuation using substitute of the non-marketed NTFP	Substitute goods approaches may be used whenever close market substitutes for non-timber benefits exist.	Using a market substitute to give a value to a gathered product is difficult. Accepting the word of the villagers concerning their food substitutes is one thing; imputing a monetary value to these products is another. Furthermore, they are substitutable as food, but not economically or monetarily. It is not sure that a gatherer is willing to exchange his NTFP harvest against an equivalent non-market substitute harvest, even if he obtains the same satisfaction in consumption. It can be said that, in an economy where currency is rare, values of use do not correspond to values of exchange.

Travel Cost	This method recognizes that for some goods or services the consumer may have to incur substantial costs (in time or money), to obtain the particular good or service. For example, a recreation experience may involve considerable travel expenses; and gathering free fuel wood may require a considerable amount of time. It assumes that the value to the consumer is at least equal to the travel costs the consumer is willing to incur to obtain the desired good or service.	Quantity of NTFP collected and the time spent in gathering are required to value the resources. Similarly, it is difficult to consider gathering time as an opportunity cost. Because, many times people remain unemployed. Many times, quantity collected is not at all related to gathering time because of un certainly. In dry regions, people collect fuel wood from forests. In case of necessary products it is difficult to assign a value based on the transport cost.
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Source: International Institute for Environment and Development (2003)

3. SAMPLING AND METHODOLOGY

The study was conducted in Karnataka. The state is one of the southern states of the country and it has around 20 percent of the total geographical area under forest. The forest in the state constitutes some of the most magnificent forests like: evergreen forest, semi-evergreen forest, moist deciduous forest, dry deciduous forest, and thorn forests. About 60 percent of the Western Ghats are located in the state. Table 3 shows area under forest in Karnataka.

Table 3

Area Under Forest in Karnataka

Forest Types	Area (Sq. Km)	%
Evergreen	4350	11.36
Semi-evergreen	1450	3.79
Moist Deciduous	5780	15.10
Dry Deciduous	7270	18.99
Thorn Forests (Scrub)	8340	21.78
Un-wooded	11094	28.98
Total	38284	100.00

Source: Govt. of Karnataka 2004

Availability of NTFPs varies in different type of forest. For collecting primary data, the districts endowed with high coverage of forests with different forest types have been selected. The selected districts are Tumkur, Chikkamagalur, Hassan, Dakshina Kannada, and Uttar Kannada. The ranges within the selected have been selected on the same criterion which was adopted for selection of districts. From the selected forest ranges, the villages having higher proportion of forest area are selected for collecting primary data from households. Table 4 shows sample frame of the study.

Table 4

Sample Frame for the Study

District	Ranges	Village Name	Type of Forest	Forest Area (Ha)
Chikkamagalore	Mudigere	Urubage	Ever Green	897
	Chikkamagalore	Marle	Tropical Thorn	533
	Aldur	Kundur	SE & MD	2050
Hassan	Sakkeshpur	Heggadde	Ever Green	3600
	Arasikere	Shankarnahalli	Tropical Thorn	724
Tumkur	Bukkapatna	Bellaru	Dry Decidious	325
Dakshina Kannada	Puttur Range	Nikkiladi	Dry Decidious	80.3
	Sullia	Maddappadi	SE & MD	4595
	Subramanya	Subramanya	SE & MD	2915.5
Uttara Kannada	Jagalbet	Jagalbet	SE & MD	9096

In each selected villages 50 households have been randomly selected for getting detailed information about the quantity and value of NTFPs collected during the year 2002-03. Totally 500 households have been selected from 10 villages spread across 5 districts in Karnataka. Total values of NTFPs have been estimated using 'local market prices'. The percentage of households covered for the study are 21 percent of SC, 13 percent of ST, 13 percent of OBC, 8 percent of Minorities and 46 percent of Others. In this paper, to make the study findings relevant for the recent year i.e. 2012-13, the value of NTFPs have been adjusted by increasing their value by 10 per cent without assuming any change in quantity of NTFPs collected.

4. FINDINGS OF THE STUDY

In the selected villages a significant proportion of households (55 per cent) collect NTFPs (Table 5). The collection of NTFPs depends upon several factors such as, availability of NTFPs in the forest, accessibility to the forest, availability of these products in the private lands, and fear of wild animals, etc. Therefore the proportion of households collecting NTFPs varies across the villages. The proportion of households collecting NTFPs is highest in villages having semi evergreen and moist deciduous (SE & MD) forests while the villages having evergreen forests account for lowest collection of NTFPs in this region.

Table 5

Households Collecting NTFPs in Study Area

Type of Forest	Total No of HHs in the Sample	No. of HHs Collecting NTFPs	% of HHs Collecting NTFPs
Evergreen	100	36	36.0
SE & MD	200	137	68.5
Dry Deciduous	100	59	59.0
Tropical Thorny	100	44	44.0
Total	500	276	55.2

In the selected villages, households collect various types of products from forest, such as; fuel wood, fodder, *muttal leaves*, *honey*, *nelli*, *magadi beru*, *kada bike hannu*, *gum*, *tumbare leaves*, *wax*, *tupra fruit*, *medicinal leaves*, *seegekai*, *gaaliaubhadi balli*, *geru*, *malli balli*, *otae*, *vate*, etc. Most of the households depend on forest for fuel wood and fodder, though there is variation in products and quantity collected across the villages. On average households collect 18 quintals of fuel wood, 12 quintals of fodder, 16 quintals of *Muttal* leaves, 60 Kilograms of *Tumbare* leaves, 9 kilograms of *Nelli* kai and 8 kilograms of *Sigekai* in the selected villages. Households collect these NTFPs mainly for their home consumption and only few households collect them for sale. In the selected villages, about 90 percent of the households collect these NTFPs mainly for home consumption and remaining 10 percent of households collect mainly for sale. It is observed that mainly landless and marginal farm households are engaged in collection and sale of these products. Fuel wood is the main item sold and other items are sold in small quantities. The selling and buying of NTFPs takes place mostly in the village or in the nearby village. The households collecting these NTFPs sell their products to rich households in the village. NTFPs are available in the particular season and in that season these are collected and marketed.

The value of NTFPs is obtained by multiplying the price into the quantity of NTFPs collected. Table 6 shows the average value of value of NTFPs collected by sample households. It shows that the average value of NTFPs collected by sample households is Rs. 7427 and it varies across the different types of forest regions from Rs. 3762 to Rs.16970.

Table 6
Value of NTFPs Collected by Sample Households (Rs/HH/Annum)

Households in Different Types of Forests	Value of NTFPs Collected (Rs/HH)
Evergreen	3762
Semi-evergreen & Moist Deciduous	4624
Dry Deciduous	7824
Tropical Thorn	16970
Total	7427

In order to know the magnitude of value of NTFPs collected in the selected villages we multiplied value of NTFPs collected per household by total forest area in the village and by total number of households. To get the value of NTFPs collected per hectare, we divided the total value of NTFPs collected in the village by total forest area in the village. Table 7 the shows estimated value of NTFPs per hectare across different types of forests in selected villages.

Table 7

Value of NTFPs in Selected Villages Across Forests Types (Rs/ Hectare /Annum)

Type of Forest	Value of NTFP/HH/Year (Rs)	Forest Area (Ha)	Total No of HHs	Total Value of NTFP (Rs) {Col 2 X Col 4}	Value of NTFP Collected Per Hactare * (Rs) {Col 5 / Col 3}
1	2	3	4	5	6
Ever Green	3762	4497	655	2464110	548
SE & MD	4624	18657	1881	8698496.4	466
Dry Deciduous	7824	405	796	6228142.8	15378
Tropical Thorny	16970	1257	771	13083638.7	10409
Total	7427*	24816	4103	30472981	1228

*Note: * obtained by dividing the total value of NTFPs in the study area by the total households in the study area.*

The above table shows that value of NTFP collected per hectare is more in case of dry deciduous forests and tropical thorny forests. Though there is abundant forest in and around the villages in evergreen and SE & MD types of forest; the value of NTFP collected by the villagers is less than expected. This is mainly due to two reasons. First, households depend on the private land for their biomass requirements and second, the various restrictions of forest department are imposed on collecting NTFPs in these areas.

Estimates of Value of NTFPs for Karnataka

In order to arrive at the total value of NTFPs for Karnataka, we use the estimates of the value of NTFPs per hectare (from Table 5) and multiply the same by the total forest area in Karnataka. Table 6 shows total value of NTFPs collected by households in Karnataka. It shows that the value of NTFPs collected by the households in Karnataka is Rs. 2043.6 crores for the year 2012-13.

Table 8

Value of NTFPs Collected by Households in Karnataka

Forest Type	Value of NTFPs Collected / Ha By HHs in Selected Villages (Rs)	Total Forest area in Karnataka (Ha)	Total Value of NTFPs Collected by HHs in Karnataka (Rs. crore)
Evergreen	548	435000	23.8
SE & MD	466	723000	33.7
Dry deciduous	15378	727000	1118.0
Thorn Forests (Scrub)	10409	834000	868.1
Total	1228@	3828400	2043.6

@ is average and not total

5. CONCLUDING OBSERVATIONS

In the selected villages 55 percent of the households collect NTFPs. About 90 of households use these NTFPs mainly for home consumption and remaining 10 percent of households sell these products in the local market. Fuel wood, fodder and *Muttal* leaves are the main products collected and the value of NTFPs collected per household is Rs.7427. The total value of NTFPs collected by the households in Karnataka is Rs. 2043.6 crores for the year 2012-13. The value of NTFPs collected by households is about 20 percent higher than the recorded value of NTFPs. Under estimation of value of NTFPs would result in lesser allocation of resources towards this sector which may lead to depletion of forest. Understanding of the total value of NTFPs and their importance in

livelihoods of households would lead to higher allocation of resources, better management of forests and finally these would help in providing sustainable livelihood opportunities.

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