AN ECONOMIC ANALYSIS OF COLLECTION, PRIMARY PROCESSING AND MARKETING OF NON-TIMBER FOREST PRODUCTS IN BASTAR DISTRICT OF CHHATTISGARH

M. Sc. (Ag.) THESIS

by

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CERTIFICATE – I

This is to certify that the thesis entitled **"AN ECONOMIC ANALYSIS OF COLLECTION, PRIMARY PROCESSING AND MARKETING OF NON – TIMBER FOREST PRODUCTS IN BASTAR DISTRICT OF CHHATTISGARH"** submitted in the partial fulfillment of the requirements for the degree of "MASTERS OF SCIENCE IN AGRICULTURE" of Indira Gandhi Krishi Vishwavidyalaya, Raipur, is the bona-fide research work carried out by **Mr. GOPAL KRISHNA ACHARYA** under my guidance and supervision. The subject of the thesis has been approved by Student's Advisory Committee and the Director of Instructions.

No part of the thesis has been submitted for any other degree or diploma (certified, awarded etc.) or has been published / published part has been fully acknowledged. All the assistance and help received during the course of the investigation have been duly acknowledged by him.

Dr. A. K. Gauraha

Chairman

Date: 22.7.2013

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CERTIFICATE – II

This is to certify that the thesis entitled **"AN ECONOMIC ANALYSIS OF COLLECTION, PRIMARY PROCESSING AND MARKETING OF NON-TIMBER FOREST PRODUCTS IN BASTAR DISTRICT OF CHHATTISGARH"** submitted by **Mr. GOPAL KRISHNA ACHARYA** to Indira Gandhi Krishi Vishwavidyalaya, Raipur in partial fulfillment of the requirements for the degree of **M. Sc. (Ag.)** in the **DEPARTMENT OF AGRICULTURAL ECONOMICS** has been approved by the External Examiner and Student's Advisory Committee after the oral examination.

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INTRODUCTION

CHAPTER – I

INTRODUCTION

1.1 Justification

Forests are the rich sources of energy, housing, firewood, timber and fodder and they also provide employment to a large section of the rural population. The role of forests in ecological balance, bio-diversity conservation, food security, protection of soil and water resources, mitigation of global warming, combating desertification and sustainable development has been widely accepted. The global forest cover is 39.50 crores hectare (FAO, 2005).

Forest plays an important role in the socio-economic development of a country like India. India occupies 2.5 percent of world geographic area supporting 17 percent of human population and 18 percent livestock of the world. The recorded forest area in India is about 7.65 crores ha, 23.02% of total land mass. However, the actual forest cover is just about 19% of the total geographical area (FAO, 2005). The per capita forest area in the country is 0.08 ha as compared to the world average of 0.64 ha. The dense forests (crown density more than 40%), open forests (crown density less than 40%) and scrub including mangrove forests (crown density less than 10%) accounted for 48, 34 and 18 percent of forest area, respectively (Forest Survey of India, 2011).

Demand for forest products and services in the country are increasing with rapid economic growth, industrialization and increase in population.Forests are renewable resource and contribute towards economic development. Forests occupied a share of 1.7 percent to (GDP) Gross Domestic Product (ICFRI, 2011). Forest products contribute between 20-40% of total income of households in forest areas. At present a large section of population depends upon forests for their livelihood.

Forest produce can be broadly divided into two categories Major Forest Produce including timber yielding trees, ornamental trees and trees used for paper pulp etc. and Minor Forest Produceincluding roots, shoots, leaves, fruits, flowers, vegetables, herbs, gum, honey, wax, lac etc. NTFPs are defined as "all biological materials, other than timber, which are extracted from forests for human use." NTFPs include fruits and berries, nuts, spices, medicinal plants, oils, gums, resins, honey, mushrooms, weaving and dying materials, aromatics, and recreation (FAO, 2005).

The collection and sale of Non-Timber Forest Produce is the main economic activity for the majority of the tribal population as it offer employment that provides up to half the income of about 25 per cent of the country's rural labour force (Muthyalu, 2008).

NTFPs have become an alternative and vast source of income to forest dwellers in India. In forestry NTFPs appeared to have the potential for poverty reduction and sustainable livelihood. Trades in NTFPs generate employment opportunities, substantial income and support livelihood among rural populations in tropical regions globally. Currently about 75% of poor people in the world depend on NTFPs for their subsistence while 80% of forest based people in the developing countries use NTFPs daily (Aiyeloj and Ajewole, 2006). There is a high level of actual use of NTFPs by rural poor and its collection and marketing is a traditional and cultural activity in many regions of the world, as it offers employment that provides up to half the income of about 25 % of the country's rural labour force. People who live in relatively remote areas traditionally rely on local forest products because they are more easily available and affordable than products manufactured in cities.

India is an agriculture-driven country where 70% of its population lives in rural areas; for tribals this is as high as 92% (Johnson *et al.,* 2013). In some states of

India, NTFPs have contributed 30 to 70 percent of the total income of households and majority of the forest dwellers depend on forests for 25 to 50 percent of their food requirements.In many states NTFPs contributes major proportion of the revenue to the State Forest Departments, like Orissa, Madhya Pradesh and Chhattisgarh (Ministry of Environment and Forests, 2008). The states of Madhya Pradesh, Chhattisgarh, Orissa, Maharashtra and Andhra Pradesh account for more than 75 percent of traded NTFP and 65 per cent of the tribal population concentrated in India (Muthyalu, 2008).In India over 50% of forest revenues and 70% of export income are from NTFPs collected from forest. It also provides 50% income for 20-30% of rural people in India. The monetary value of Medicinal and aromatic related global trade is over 60 billion USD. NTFPs contribution to household income is 49 percent in India.

Commercial NTFPs are estimated to generate Rs. 540 crores annually in India. It exports a large number of NTFP to other countries earning foreign exchange revenue to the tune of Rs. 1800 crores annually. India holds monopoly in world trade over some of the NTFPs as Karaya gum (*Sterculia urens*), myrobalans (*Emblica officinalis, Terminalia chebula*), Sandalwood chips and dust (*Santalum album*). The export of NTFP has grown by 20-25% over the past few years and during 2006-07, India earned Rs 2250 crores from export of NTFP and their valued added extracts (Appendix - I).

In India sustainable harvesting and management of NTFP extraction, together with improved market structures, have been promoted as a strategy to aid poverty alleviation and wildlife conservation simultaneously (Gubbi and Macmillan, 2008). About 14-23% of these species are being annually destroyed on account of irresponsible extraction which leads to estimated loss of about 50% of germplasm of NTFPs. Most collectors (82%) did not wish to continue harvesting NTFPs if

alternative livelihoods from agriculture could be provided, and none wanted their children to be NTFP collectors (Gubbi and MacMillan, 2008).

Chhattisgarh is third largest state of India in terms of forest cover which is 5.6 million hectares which is 46.39% of state and 8.06% of the country. Madhya Pradesh and Arunachal Pradesh being at first and second in terms of forest cover (Forest Census, 2011).The Forest Department, Government of Chhattisgarh helps the rural people financially, and by making SHGs for collection, procurement, processing and export of NTFPs through Chhattisgarh Minor Forest Products Marketing Federation (CGMFPFED), which is very marginal as compared to the potential. Although NTFPs can be processed into a number of value-added products, it is usually sold in the raw form by the primary collectors.CGMFPFED has a scheme to share 80% of profit from NTFP trading as incentive wages to collectors of tendu leaves, 15% for collection, Sale and the warehousing and the remaining 5% for temporary reimbursement of costs to Societies (Johnson *et al.*, 2013).

Out of the total population of Chhattisgarh, tribals constitute about 32.5% mostly live in dense forested areas in Sarguja and Bastar(Census, 2011) and are known for their unique lifestyle, rituals, traditions and superstitions. Some of the major tribes of Chhattisgarh include Gond, Baiga, Korba, Abhuj Maria, Bison Horn Maria, Muria, Halba, Bhatra and Dhurvaa tribes. Majority of the tribes of Chhattisgarh depend upon forestry, hunting, fisheries and some local cottage industries for their livelihood.Bastar is the land of tribes and about 70% of the total population of Bastar comprises tribals, which is 26.76% of the total tribal population of Chhattisgarh. The combined population of Scheduled Castes and Scheduled Tribes in Chhattisgarh is significantly higher at 44.7 percent (Census 2011). A major part of the household consumption and income is based on forest gathering, with agricultural

activities providing supplementary income among these tribes or vice-versa. They primarily dependent on forest produce, which they gather and sell or directly consume.According to an estimate made in Bastar District of Chhattisgarh, the maximum sustained timber yield from one hectare of forest was about 10m³ every 20 years yielding a net value of Rs. 20,000while, Non-Timber Forest Products harvested every year produced a net income of Rs. 2,00,000 for the same period (Sinha 2008). Most of the NTFPs are collected by the tribal and villagers residing in and around the forests. About 60 percent of NTFPs production is consumed locally. Apart from this, a large amount of produce collected is sold in local market, mandis, mostly at cheaper rate to the middlemen who sell them at a premium to the industry.

Table 1.1: Status of Trade of Non-Timber Forest Products in Chhattisgarh (2012)

S. No.	Category of NTFPs	Species of NTFPs	Estimated Annual Trade (in Rs. Crores)
1.	Nationalized	TenduLeaves,Sal Seeds, Harra, Kullu Gums, Dhawda, Babul and Khair Gums	750
2.	Non- Nationalized	Tamarind, Mahua, Lac, Kosa, Mahul Leaves, Chironjee, Baibairing, Vanjeera, Kalmegh, Aonla etc.	750
	Total		**1500**

Source: CGMFPMFED, Head Office, Shankar Nagar, Raipur

1.2 Objectives of the Study:

The specific objectives of the study were as follows.

1. To find out the collection and marketing pattern of major Non–Timber Forest Products (NTFPs).
2. To examine the marketing channels, costs, margins and price spread of major NTFPs.
3. To work out the economics of NTFPs processing at primary level.
4. To find out the major constraints in collection, processing and marketing of NTFPs and suggest some policy measures.

Table 1.2: Trade of important NTFPs in Chhattisgarh State (2012)

Nationalized NTFPs			
S. No.	Name of NTFPs	Approximate Annual Production (in Lakh Quintal)	Approximate Value (Rs. Crores)
1.	Tendu Leaves*	16.40 (Lakh Std. Bags)	464.90
2.	Sal Seeds*	7.22	30.43
3.	Harra *	0.49	4.90
4.	Kullu Gum	0.076	2.25
5.	Dhawda, Khair& Babul Gum	0.095	0.40
	Sub Total	24.28	502.88
Non-Nationalized NTFPs			
1.	Tamarind*	10.00	150.00
2.	Mahua Flower*	7.00	112.00
3.	Mahua Seed*	5.00	75.00
4.	Kosa Cocoons	16 Crores no.	40.00
5.	Lac	1.00	90.00
6.	Aonla	3.00	15.00
7.	Chironjee*	0.50	100.00
8.	Mahul Leaves	0.52	5.30
9.	Honey*	0.05	3.50
10.	Baheda*	0.29	2.03
11.	Karanj Seeds*	0.30	2.00
12.	Kalmegh*	0.14	1.90
	Sub Total	27.80	596.73
	Total	**52.08**	**1099.61**

Source: CGMFPMFED, Head Office, Shankar Nagar, Raipur

1.3 Limitations of the Study:

1. Though there are more than 50 NTFPs species produced in Bastar District but only 8 popular and easily marketable species are considered under study.
2. There are seven development blocks in Bastar District but only three are selected for the study.

1.4 Set-up:

This present thesis has been organized into five chapters including the present introductory chapter which is Chapter–I Introduction. Chapter–II is review of literature of important research works done by previous researchers. Chapter–III deals with materials and methods of the study. Finally the results and discussion are represented in Chapter–IV and Chapter–V includes summary, conclusion and suggestions for the future research work.

REVIEW OF LITERATURE

CHAPTER-II

REVIEW OF LITERATURE

This chapter deals with the review of the research works done in the past relating to the problem titled "An Economic Analysis of Collection, Primary Processing and Marketing of Non-Timber Forest Products in Bastar District of Chhattisgarh". A brief account of works reported by the past researchers has been discussed keeping in view the objectives of the study, under the following sub headings:

2.1 Pattern of Collection and Marketing of Major NTFPs.

2.2 Livelihood improvement and poverty alleviation through NTFPs.

2.3 Marketing channels involved in marketing of NTFPs.

2.4 Processing of NTFPs at primary level.

2.5 Major constraints in collection, processing and marketing of NTFPs.

2.1 Pattern of Collection and Marketing of Major NTFPs.

Pradhan (1995) studied the marketing of Non Timber forest Products (NTFPs) by tribals in Orissa. He reported that the number of marketing channels was relatively more for non nationalized items than for nationalized items. The nature of marketing channel varied from one NTFP to another. The tribal's share in the consumer rupee varied from 17 per cent in the case of tendu leaves to as 100 per cent in the case of mango.

Marothia and Gauraha (1996) evaluated the performance of five Primary Minor Forest products Co-operatives (PMFPCs) of Raipur district in Madhya Pradesh (now Chhattisgarh) in managing the collection and trade of tendu leaves. They reported that the effective collection season of tendu leaves was only 45 days duration. Nearly 74 per cent of the total expenditure was accounted for by wages paid

to the members. The other major components of expenditure were go-down rent, transportation, watering of leaves, salary and commission. It was found that less than 1.50 per cent of the total expenditure was incurred the leaf yield. On an average, each society incurred an expenditure of Rs. 504353 and the net value of tendu leaves sold was Rs. 720398. The study also revealed that all the members interviewed opined that management of tendu leaves under the co-operative system had benefited them at least in terms of getting proper wages, training in collection and pruning and generally the phadmunshis made correct entries of their produce in their collection cards.

Kumar (1996) studied the marketing of Non-Timber Forest Products (NTFPs) in Rohtas district of Bihar. He found that chiraunji (dry fruit) was exchanged by weight for rice by middlemen. The market price appeared to be 25 times higher than the prices received by tribals indicating the exploitation of tribals in a marketing system, which is predominantly capitalistic.

Delang (2005) evaluated the economics of non-marketed non-timber forest products in Pwo Karen, Thiland. He evaluated and compared the results from travel-cost method and proxy-value method to estimate the economic value of non-marketed NTFPs consumed by gatherers themselves. The evaluation is done on two bases namely time needed to collect the wild food plants and value of substitute products. The results reveal that the NTFPs extracted from old forest has the highest value as the average time spent is 4280 minutes/household/year and those extracted from near the lake has lowest value as it costs only 760 minutes/household/year.

Banafar *et al.* (2005) reported that marketing is one of the unorganized and under managed sector in Chhattisgarh state. Marketing plays an important role in Bastar District of Chhattisgarh state. Bastar district has difficult terrain, lacks infrastructural development for marketing medicinal, herbal and aromatic plants.

Producer, village merchant, dealers were generally found engaged in assembling of medicinal, herbal and aromatic plants. The major constraints in production and marketing of medicinal, herbal and aromatic plants are the poor socio-economic conditions of the farmers as the cultivation of medicinal, herbal and aromatic plants are highly capital intensive. As far as constraints are marketing of medicinal, herbal and aromatic plants, in concerns the role of producers-seller was negligible in the fixation of the price.

Kumar *et al.* (2006) conducted the study at Uttar Kannada District of Karnataka with an attempt to document the market information related to some important Tree species in Sirsi and Siddapurtalukas. The study was based on the information which was inquired and gathered from 100 primary collectors who collect and sell or market these tree species. Marketing information was collected from forest contractors and market functionaries. The study explains that a simple value additions increase the selling price at primary collector level and industrial level.

Muraleedharan and Sreelakshmi (2007) examined some of the economic aspects of commercialization of Non-Timber Forest Products (NTFPs) in tribal hamlet of Wayanand Wildlife Sanctuary, Kerala. The over-extraction of NTFPs leads to serious erosion and which results to the loss of biodiversity. Collectors falling in BPL group collect most of the species as a distress duty because the income from the collection and opportunity cost of labours is very low in the area. The NTFPs extraction has been divided into three stages, Stage – I, II and III on the bases of difference between quantities demanded (Qd) and marketable surplus (Qms). The study revealed that NTFPs extraction belong to stage – III in the study area (Qd>Qms) which results to over extraction.

Patel *et al.* (2008) studied the marketing of Minor Forest Price of (MFPS) in Gujarat. They observed a high variability in the marketing and price of MFPs. They found that there was a decrease in the marketed quantity of MFPs like tendu leaves, flower and deli but an increase in gum and other products. The quantity collected in the previous year was found to have a significant impact on the marketed quantity. The prices of all MFPs had in gum and other products. The quantity collected in the previous year was found to have a significant impact on the marketed quaintly. The prices of all MFPs had increased considerably. The quantity marketed semi-shelled indifferent to the prices of MFPs, which indicated that production was not guided by price behaviors.

Sinha (2008) analyzed the economics of non-timber forest products in Kanker District of Chhattisgarh and observed that the net price received by the collectors was highest being 98 percent in direct selling to consumers and 35 to 71.27 percent when one middleman involved. He also found out that on an average 305.72 Kg. NTFPs was collected by sample households. Tendu leaves contributed highest in income generation with Rs.1165 (34.33 percent) followed by Lac Rs.700 (20.63 percent) and the lowest being Jamun fruits with Rs.21.42 (0.63 percent).

Muthyalu (2008) conducted the study on Collection and Marketing Practices of Non-Timber Forest Produce in Adilabad district of Andhra Pradesh. He found that in the tribal areas most of the tribal communities are collecting and selling NTFP items. In the study area, agricultural income constituted highest contribution (67.2 %) in income followed by NTFPs collection with 30.6%. The NTFPs collectors sell 89 % of their produce like tendu leaves, gums etc. to the forest department and rest, they sell directly to the ultimate consumer or to the processor.

Gakou*et al.* (2009) studied on non Timber Forest Products (NTFPs) in rural Mali in West Africa interviewed both men and women about NTFPs to determine the differences in gender perceptions in forest use, i.e., who collected which NTFP in the household and who was aware of the use of which products. They reported that according to men 57 per cent of the products being collected in their household were collected by males and 43 per cent by females and according to women, 81 per cent were collected by females and only 19 per cent males.

Bohra (2009) evaluated that the commercial use of Non-Timber Forest Products is becoming an important and popular mechanism for promoting rural economy along with biodiversity conservation. Rajasthan known for its adverse climatic conditions has a rich bio-diversity. NTFPs are domestically used for fodder, food and fuel; commercially they are used for the products as Tenin, Dye, Fiber, Oil, Gum, Rasin etc. With such valuable natural resources are present and scare also it is necessary to conserve, promote and make awareness about it to the local people.

Awono et al. (2010) observed that women are the primary gatherers and traders of non-timber forest products (NTFPs) but they have limited access to processing technologies, marketing strategies and market information. They also accessed the impact of the research and training provided by CIFOR and found out that the traders initially interviewed, 95 percent of them were women. 81 percent of traders said their incomes increased as a result of the training received, 11 percent of traders mentioned a negative impact and 8 percent reported no impact. The average increase in income for those who benefited was 55 percent. The revenue gained from NTFPs was used for basic household needs.—school fees, food and health costs. These results indicate that a capacity building program could reduce the constraints

faced by traders by providing them with marketing information, accounting tools and processing and storage technology skills.

Ahenkan and Boon (2010) reported that the collection and marketing of NTFPs in Ghana are being promoted as a potential solution to the high rates of malnutrition, poor health of the rural population and the spread and intensification of poverty. Despite the potential of NTFPs in poverty reduction and livelihoods improvement in rural areas of Ghana, little is known about their collection, processing, packaging and labeling. The marketing of these products faces a number of critical processing, labeling and marketing challenges. The NTFPs marketing is unorganized, dispersed and farmers also lack the necessary marketing skills and information required for optimal performance. Results reveals that agriculture is the main source of income for the respondents and among them 61.0% cultivate cocoa, 12.5% maize, 11.1% cassava, 10.3% tree farming and 5.5% oil palm production as their major farming activity. Besides that 62.2% of them cultivate/farm NTFPs to supplement their income, 11.5% due to poor cocoa harvest, 9.2% due to lack of alternative activities and 6.2% for the forest conservation. Among the NTFPs Beekeeping is highly adopted with 44.4%, followed by Grass-cutter rearing, Mushroom cultivation, Snail rearing and Medicinal plants cultivation which occupies 39.8%, 28.6%, 29.3% and 2.3% respectively. About 32% people make more than half of their income through NTFPs.

Rath and Mohanty (2011) studied the collective NTFPs marketing in Koraput, Raygada, Nuapada, Kalahandi and Malkangiri Districts in Orissa. They observed that collective marketing of NTFPs is a common strategy to help securing the rights and benefits for the primary collectors, particularly for women who are the primary collectors along with the men who are traders and middleman. The NTFPs

they collect includes mahul, hill-broob, tamarind, siali leaves, honey, chironjee seed etc. The co-operative group trade both raw and processed form of NTFPs. 286 villages were covered having 583 SHGs including 8851 families with the business turnover of Rs. 1.80 crore and having a profit margin of Rs. 87.65 lakh governed by 29 large co-operative societies.

Piya et al. (2011)analysed the socio-economic characteristics of households that influence the collection and marketing of NTFPs by Chepangs community in Chitwan district in Nepal. They found that nearly 62 percent of the total volume of NTFP traded from Shaktikhor was exported in crude form to India; while only 35 percent of the NTFPs were bought by the national processors. On an average NTFPs contributed 13.2 percent to the total income of the households, ranging from 0 percent to a maximum of 60.3 percent.

Aiyeloja*et al.* (2012)evaluated the importance of non timber forest products trade in Ihiala area, Anambra state, Nigeria. The study revealed that gender ratio of 3:1 (Female: Male) for NTFPs collection and trade that means women (75.0%) are more involved than men (25.0%). Traders between 31 – 40 years old form the majority (31.7%), followed by 51- 60 years old (26.7%), then 41 – 50 years old (21.7%.) and at the end the young traders form only about 10.0%. NTFPs are mainly used for food (35%), medicine (15%), food and medicine (25%) as well as construction (13.3%) in the study area. About 75% of NTFPs traders possess between 1 -10 years of trading experience of NTFPs. The initial take off capital for traders were mostly raised from personal savings (73.3%) and cooperative societies (21.7%). Profitability analysis shows that NTFPs is profitable with average profit margin of Naira (Nigerian currency) 500/kg Guinean pepper, and Naira 1000/basket.

2.2 Livelihood improvement and poverty alleviationthrough NTFPs.

Appasamy (1993) studied the role of Non-Timber Forest Products (NTFPs) in a subsistence economy of the Kadavakurichi Reserve Forest in Tamil Nadu. The value of fuel wood, fodder and honey collected annually from the reserve forest was estimated to be about Rs. 1.9 million. Out of this, fodder alone accounted for Rs. 1.6 million followed by fuel wood (Rs. 250000) and honey (Rs. 37500). He reported that the value of NTFPs collected and used was about Rs. 2090 per hectare per year.

Ganapathy (1998) studied the role of Non-Timber Forest Products (NTFPs) in the tribal economy of Kollegaltaluk of Karnataka. The study covered four forest ranges of Kollegaltaluk viz., Hanur, Kollegal, M.M. Hills and Rampurram. He reported that NTFPs generated the maximum employment (42.96%) for the tribal households followed by farm employment (22.06%) allied employment (12.72%), wage employment (11.86%) and other sources of employment (10.40%) The analysis of the composition of income of the tribal households revealed that NTFPs was the main income generator.

Schreckenberg *et al.* (2007)examined the key factors that influence the outcome of NTFP commercialization initiatives for poverty alleviation and rural development in tropical forest areas. NTFP commercialization can be defined as being successful if it is a transparent, equitable and sustainable activity that has a positive impact on poverty reduction, gender equality and resource access, tenure and management. They found out that Innovation, Collaboration, Entrepreneurs and Legislative and policy environment are four key factors for the successful commercialization of NTFPs.

Gubbi and MacMillan (2008) examined whether NTFPs collection can solve the livelihood problems and give good economic return to collectors. They found in

the study that black damar resin from the tree *Canariumstrictum*(61.3%) and mace from *Myristica spp.* (35.5%) were the most commonly collected NTFPs, and most valuable NTFPs was honey from *Apisceranaindica.* Mean daily revenue of NTFPs collection was USD 3.15± SD 4.19 /day. For 61% of respondents NTFPs are main source of livelihood and rest 39% collected NTFPs to supplement their income. Most collectors (82%) did not wish to continue harvesting NTFPs if alternative livelihoods from agriculture can be provided.

Kandari and Omprakash (2009) conducted a study on enhancing livelihood through non-timber forest products in Keonjhar District, Orissa. NTFP collection is one of the main sources of livelihood for the tribal people who live Below Poverty Line (BPL) in Keonjhar District; these NTFPs are traded in local market which give them maximum returns. Mahua flower and Kusum knots accounts for 36% of the total NTFPs collected by the households along with Mahua seed (9%), Amla (5%), Baheda (5%), Char seed (5%) and Harida (4%) in the district. Mushroom yields maximum market return while sale of Baheda obtained lowest return.

Jagwan*et al.* (2010) highlighted the interface among livelihood and nutritional aspects of non-timber fruit products in Garhwal hills Himalaya, Uttarakhand. They found out that many of the NTFPs are used and eaten raw, but not considered as a source of alternative food products. The study investigates the distribution, botany, phenology, yield and other uses along with the cost-benefit analysis of these plant species. These wild fruits have higher fat content than the cultivated fruits and the total monetary benefit was higher than the inputs for all these wild edible fruits with maximum net return which indicates these are more beneficial than cultivated ones.

Singh *et al.* (2010) examined the Contribution of NTFPs in the livelihood of mangrove forest dwellers of sundarban in West Bengal and observed that 66-79% of

people in Sundarbans are agricultural labours and about 50% of agricultural laborers are landless who depends on collection and selling of NTFPs which provides 79% of the annual household income. The contribution of NTFPs to the total annual household income ranged from Rs. 57000- Rs 1.02 lac that constitutes 76-92 % with an average of Rs. 75000 per household per annum. The aquatic NTFP - fishes, contributed highest (Rs. 64800, accounting 49%) followed by prawn seeds contributing (Rs. 56000 accounting 42%) per household per year from NTFPs while, terrestrial NTFPs like honey and bee wax contribute only around Rs. 4500 (3.5%).

Singh and Quli (2010) evaluated the contribution of NTFPs in tribal economy and also found out the marketing channel of non-timber forest products. The study was carried out at 50 villages of Bandgaon and Goelkera blocks of W.Sighbhum district (58.31% of tribal population) of Jharkhand. The study concludes that tribals depend to a great extent on non-timber forest product economically. But the labours involved in collection of the produce are ignored. The scenario of economics is too unrewarding for the collectors. This study also reveals that the role of opportunity cost and exploitation by middlemen ranking the highest. Some measures also been suggested to improve the condition of tribals as well.

Sharmah and Arunachalam (2011) evaluated the contribution of non-timber forest products to livelihood economy of people living in forest fringes in Changlang District on Arunachal Pradesh. They found that the total contribution of NTFPs to annual household income was maximum (23%) in the villages of Miao circle followed by Diyun circle (21%) and Nampong circle and Vijaunagar circle (19% and 18% respectively). It was recorded minimum (11%) in the villages of Bordumsacircle. The result reveals that the consumption of fuelwood per household per year recorded maximum (7617.00 kg) at mile village and minimum (3582.00) at Rima village while

consumption of wild edible forest products has been estimated as Rs. 1229/household/year at Lamabasti and Rs. 9546./household/years at Bhudhisatta village.

Ghosal (2011) conducted the study on importance of non-timber forest products in native household economy of forest fringe dwellers in Purulia, Bankura and Midnapur Districts of West Bengal. He found that lack of agricultural land and industrial activities forces the forest dwellers to collect the NTFPs on the regular bases for their livelihood they also make some value added products to have some extra income. It has been estimated that about 20-50% of the total household income comes from NTFPs harvesting in the study area every year. Sal leaf and Mahua flower are the most important among all the NTFPs and ranked with Grade-5 by the forest villagers.

Maske *et al.* (2011) studied the impact of non timber forest produces (NTFP's) on rural tribes economy in Gondia District of Maharashtra and suggested that by effective collection and marketing of non-timber forest products villagers can improve their socio-economic conditions, increase their income level and employment opportunities as well. They also found out that non-timber forest produce is the next major alternative source of income after agriculture in study area which provides Rs. 917600, Rs. 917000 and Rs. 499000 from Asalpani, Bagadband and Timezari respectively which contributes 39.32%, 39.30% and 21.38% with Rs. 8847.57, Rs. 14310.20 and Rs. 7520.26 annual income/household respectively which clearly shows that NTFP's collection and selling for extra income has its greater impact on the rural tribe economy.

Tewari (2012) reported thatthe NTFPs sustain the rural and semi-urban poor in meeting their needs and about 85% of households in rural South Africa use NTFPs

in their daily lives. He also revealed that NTFPs can play a bigger role in South Africa by mitigating the effects of hunger and malnutrition and engendering rural development. The NTFPs generate higher potential for income and employment because the collection, value addition and their trade activities are labour intensive in nature and their labour absorption capacity is enormous. South Africa has about 35% of people who live below poverty line in rural areas and suffer from hunger and malnutrition; the development of NTFP economy can contribute a lot towards poverty alleviation and reducing hunger.

Tynsong*et al.* (2013) examined the impact of an important NTFP *Piper peepuloides* (wild pepper) in livelihood improvement of rural people of tropical evergreen and subtropical evergreen forests of South Meghalaya. The study reveals that the average gross annual production of wild pepper is 7 quintals/ha, and final market price fetches Rs. 336,000/ha, out of which 42% of the money goes to the grower, 16% to local trader, 23% to dealer, 17% to retailer, 1.2% to wages of labourers, and 0.6% to transport. They also conclude that domestication and marketing of wild pepper fetched high percent profit to the grower and cultivation, processing, and marketing of wild pepper are economically viable practices in those areas where local habitats are favorable for its growth.

Johnson *et al.* (2013) reported the non-timber forest products as a source of livelihood option for forest dwellers in India and most of the developing countries. They revealed NTFPs have attracted considerable global attention due to benefiting people and industries. Most tribals and villagers who live in forest regions depend on NTFPs as the source of their livelihood as they providesustenance and regular income. Companies and cooperative federations like UFDC (Uttarakhand) CGMFPFED (Chhattisgarh), MPMFPFED (Madhya Pradesh), GCC (Andhra

Pradesh) and GMC Ltd, (Tamil Nadu) are involved in organized NTFP trading. CGMFPFED shares 80% of profit from NTFP trading as incentive wages to collectors of tendu leaves, 15% for collection, sale and the warehousing and the remaining 5% for temporary reimbursement of costs to Societies. 20–50% loss can occur due to presence of soil, sand, mud, foreign material and excess moisture which can be reduced or eliminated by doing value addition at the grassroot level which can fetch the gatherers higher value.

2.3 Marketing channels involved in marketing of NTFPs.

Aiyeloja and Ajewole (2006) carried out their research the marketing of some non-timber forest products in Osun state of Nigeria and observed that NTFPs are grossly affected by seasonal changes which affect their availability and prices. Chewing sticks and Bushmeat are major two NTFPs for the study area. Marketing channel for chewing sticks includes producer (harvester) → processor→ wholesaler → retailer which fetches about 40-50 Naira (Nigerian currency) on the other hand Bushmeat is directly sold by hunters to retailers and restaurant owners. The study reveals that total marketing cost and marketing margin of chewing sticks are higher than of bushmeat which is 15440.40 and 4,939.60& 3120 and 1,680 respectively. The producers share in consumer rupee is also higher in case of chewing sticks.

Mishra *et al* (2008) studied the marketing margins of Chirongi in Chindawara district of Madhya Pradesh. The results indicated that the marketing margins for the forest produce varied significantly from channel to channel. The price spread was maximum in the case of channel C (collector village merchant primary wholesaler secondary wholesaler retailer consumer) and minimum in channel A (collector – village merchant retailer consumer). They concluded that that the producer's share and marketing margins were directly and significantly associated with the length of

the channel. The lower was the marketing margin and higher was the producer share in the consumer's rupee and vice versa.

Awasthi (2009) analysed the NTFPs marketing system in Baitadi District, Far-West hills of Nepal where there is no system for public collection and dissemination of NTFPs market prices. The study was focused on marketing of five major tradable NTFPs namely Ritha, Sugandhwal, Chiraito, Tejpat and Amla. The study revealed that 27% households are involved in the collection and marketing of NTFPs which generates about 35% of their annual income. 20% of the total NTFPs production is exported from Baitadi District which contributes more than 50% of the export of the region and 10% of the national export solely. It is observed that more than 81.5% of the collectors are facing legal problems regarding provision of royalty and tax, collection permits, license system and export permits.

Lim *et al.* (2009) conducted a preliminary survey of markets around Pasoh Forest Reserve of Malaysia to collect data on sales of Non Timber Forest Products (NTFPs). They identified eight types of markets in 40 rural and two urban communities. Urban markets offered a greater variety of NTFPs. It was observed for number of sellers per day-2.4 in urban markets compared to 3.2 in rural, markets. Due to this difference, sellers in urban markets grossed nearly 3 times revenue per day as did sellers in rural markets.

Gupta (2010) studied the marketing systems of NTFPs in the Rapti hills of Nepal and found that every year about 10,000 to 15,000 tons of more than 100 species of NTFPs are commercially harvested and traded with forestry share of the GDP is estimated at 15 % from the mid-hills of Nepal. Marketing infrastructure in the areas of NTFP origin is very poor which discourages the gatherers and traders to market it with high efficiency. The collectors of NTFPs often dependents upon local traders or

middlemen to market their products which disable them to export to the other countries.

2.4 Processing of NTFPs at primary level.

Prasad *et al.* (1999) conducted the study on the value addition options for non-timber forest products at primary collector's level in Chhindwara district of Madhya Pradesh and evaluated that NTFPs yields poor returns when they are sold in raw form but simple value addition options like washing, cleaning, drying, proper storage and grading which can be easily carried out at primary collector's level fetches more income and per Kg. returns. The increased returns are from Rs.6 483 per year to Rs.9317 (43.7% increase) per household. The increases in price of collected produce ranges from Rs.2 .00 per kg of mahua flower to Rs. 13.00 per kg. forchironjee.

Kalu and Racheal (2006) studied the involvement of women in processing and marketing of NTFPs in Benin City, Nigeria comprising 39 species from 32 plant families. Women constitute 50-60% of labour in agriculture; similarly the study indicated that 57.15% and 48.85% of women were involved in marketing and processing of edible NTFPs respectively. The data on number of people employed in processing and marketing and consumer preference were analyzed through ‘t’ test and ANOVA was used for market channels data. There was significant difference among different marketing channels. It also showed higher average profit for processing than marketing enterprise which was 52.59% and 47.41% respectively.

Morsello*et al.* (2012) evaluated the effects of processing of Non-Timber Forest Products and Trade Partnerships between forest communities and processing companies. They revealed that the households involved in NTFP processing without partnership, were associated with negative measures of well-being than households in the excluded category. In contrast, households in the category without processing and

with partnership were more frequently associated with positive outcomes. The combination of product processing and the presence of a partnership were also associated with positive indicators of well-being. The results indicate that establishing partnerships may enhance the financial outcomes of NTFP trade for local communities, but practitioners need to use caution in adopting the processing strategy. With respect to conservation, the three strategies are promising for reducing deforestation, but more pervasive impacts, such as hunting, might increase.

2.5 Major constraints in collection, processing and marketing of NTFPs.

Marothia and Gauraha (1992) studied the role of Denationalized Minor Forest Products (DMFPs) in two tribal villages namely Nirrabeda and Farsiya of Raipur district of Madhya Pradesh (now Chhattisgarh). The DMFPs studied were categorized into eight categories viz., tubers and roots, bark and fibers, leaves, fruits, flowers, seeds, gums and biological products. Out of these, on an average, biological products contributed 38.42 per cent (Rs. 1242) of the total income per household earned from DMFPs followed by fruits with 36.52 per cent (Rs. 1180). When individual DMFPs were considered, lac contributed the most to total income from DMFPs with 32.18 per cent followed by aonla with 24.16 per cent. With regard to the per unit value of DMFPs, the cocoon of kosha had the highest per unit value fetching about Rs. 12200 per quintal followed by cherongi and lac with Rs. 6000 each per quintal.

Marshall *et al.* (2003) observed that although trade in non-timber forest products (NTFPs) is widely promoted worldwide for achieving rural development but according to recent researches NTFP commercialization is not often successful. Apart from increasing financial income, commercialization of NTFPs can provide multiple benefits to the community like strengthen co-operative organization, improve social

justice and efficient utilization of resources etc. The factors influencing the commercialization of NTFPs like production, collection, processing, storage, transport, marketing and sale should be improvised for the success of it and improvement of the rural peoples.

Pethiya (2003) attempted to highlight that the socio-economic role of forests, particularly by the rural poor who depends upon collection and marketing of NTFPs. It is observed that forest dwellers generally finance their needs by way of advance trading of NTFPs with the traders, who have the accessibility to market, information and infrastructure which make bound the forest dwellers to sell their collections immediately with little or without value addition it also forces them to go for the distress sale. Setting up small-scale non-timber forest products based enterprises, through the micro-financing agency, is less destructive to the environment as compared to similar enterprises that emits pollutants. It was observed that during Mahua season, the collectors collects and sale them at Rs. 4-6/kg to middleman and during off season they buy the same at Rs. 10-12/kg to overcome the situation there is a need of institutional mechanism to support and co-ordinate the whole NTFPs value addition.

Nanavaty (2006) studied the collection of gum by women from *Prosopisjulifloratrees* in the desert villages of the Santhalpurtaluka of Banaskantha district of Gujarat. She reported women, men and children. In groups, started by 5 a.m. and walked seven to ten km. in the forest for collecting gum and returned by 2 p.m. One person collects 1 to 1.5.kg. load of gum daily after six to eight hours of hard labour under 43°C Temperature. The total gum collected by 500 women organized into eight DWCRA (Development of Women and Children in Rural Areas) groups

was 8000 kg. per month. Each member earned Rs. 400 per month from the sale of gum.

Sarmah *et al.* (2011) conducted the study on utilization pattern of non-timber forest products by the tribes (Singpho, Tangsa, Lisu, Tutsa and Chakma) in Changlang District of Arunachal Pradesh. The study was focused on the traditional use of NTFPs which contributes significant role in raising socioeconomic status of the villagers. Traditional use includes healthcare, fodder, fuel wood, house building, food security and natural recourse management etc. A total of 98 wild edible NTFPs, 89 medicinal plants, 10 fuel wood species and 9 fodder tree species were considered.

MATERIALS AND METHODS

CHAPTER – III

MATERIALS AND METHODS

The conceptual and analytical framework used in the study is presented in this chapter. This chapter deals with the materials and research methodology adopted for the present study with respect to the selection of study area, selection of respondents, selection of intermediaries, collection of data and analytical techniques. An attempt has been made to present the statistics of different aspects in order to have the knowledge of the study area. Some brief information about Bastar District and six villages are described in this chapter since the study has been undertaken there. The details of the method and materials adopted for the present study is presented below:

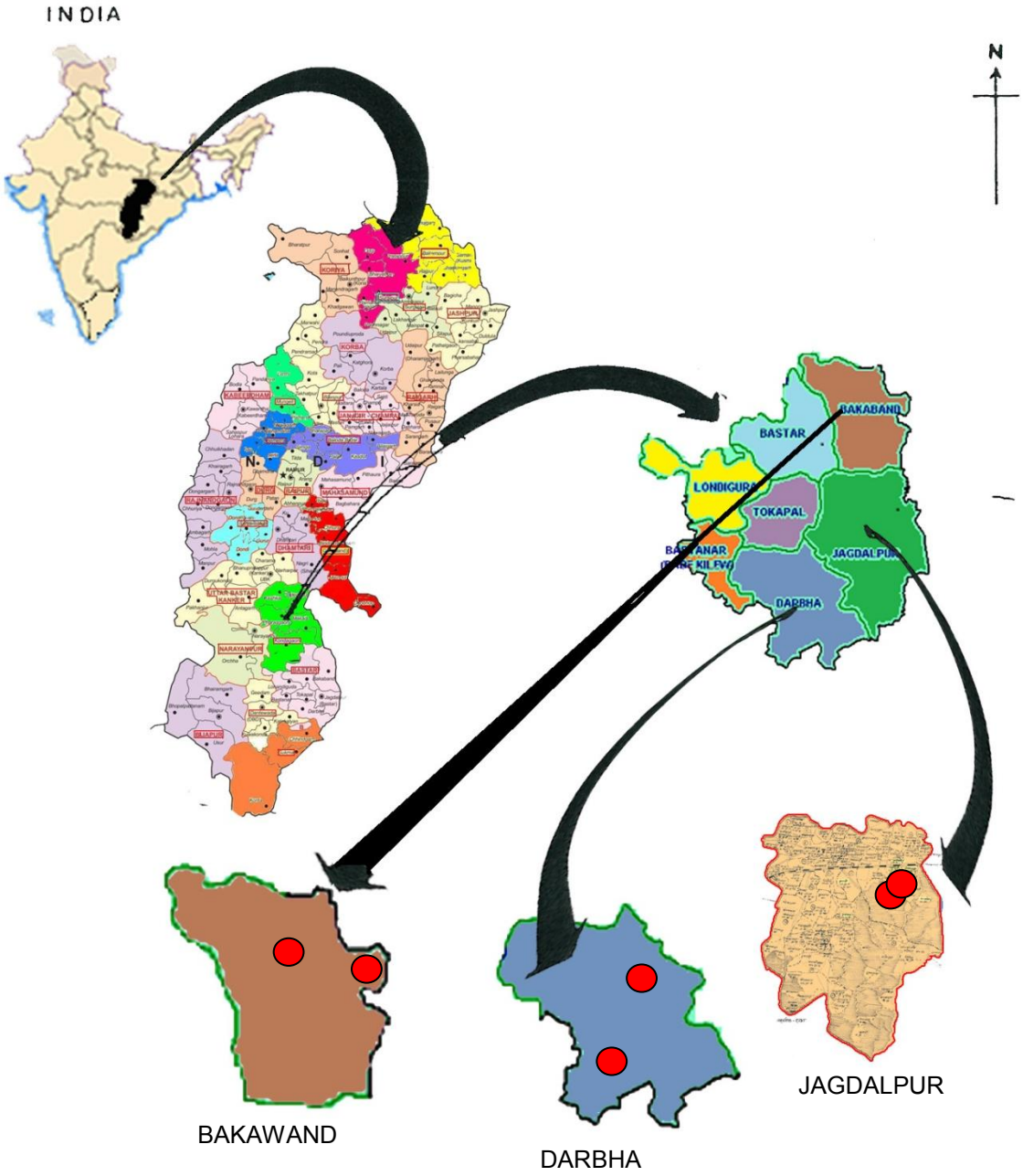
Sampling Design:

The selection of state, district, block, villages and respondents are presented under the following sub- sections:

3.1 Selection of District:

The Study was conducted in Bastar district of Chhattisgarh state. The district has an area of 8755.79 km² with having more than 75% forest cover (about 6654.24 km²). Bastar was purposively chosen for the study since it has higher forest cover and yields a variety of NTFPs and it is a true representative of the state as it contributes about 30-40% of the total NTFPs production in Chhattisgarh.

Amongst all the districts of Chhattisgarh, Bastar district is the largest producer of Tamarind with 39.22 per cent of production, followed by Honey, Kalmegh, Aonla and Mahua with the share of 20.27 per cent, 19.65 per cent, 19.44 per cent and 19.20 per cent of production respectively out of the total production of respective NTFPs.



Map of selected villages and blocks from Bastar district of Chhattisgarh

Table 3.1: Production of Non-Nationalized Non-Medicinal Minor Forest Products (2012)

S. No.	Name of NTFPs	Production (in Qt.)						
		Jagdalpur Circle	Kanker Circle	Raipur Circle	Durg Circle	Bilaspur Circle	Surguja Circle	Total
1.	Mahua	58000 (19.20)	49000 (16.22)	27000 (8.95)	35000 (11.59)	80000 (26.49)	53000 (17.55)	302000 (100.00)
2.	Tamarind	200000 (39.22)	185000 (36.27)	25000 (4.90)	10000 (1.96)	64000 (12.55)	26000 (5.10)	510000 (100.00)
3.	Karanj	3000 (10.71)	11000 (39.29)	1000 (3.57)	2000 (7.14)	3500 (12.50)	7500 (26.79)	28000 (100.00)
4.	Aonla	5500 (19.44)	4300 (15.19)	300 (1.06)	4500 (15.90)	5700 (20.14)	8000 (28.27)	28300 (100.00)
5.	Honey	750 (20.27)	700 (18.92)	500 (13.51)	500 (13.51)	650 (17.57)	600 (16.22)	3700 (100.00)
6.	Kalmegh	2800 (19.65)	1000 (7.02)	3750 (26.31)	5500 (38.60)	1200 (8.42)	000 (00.00)	14250 (100.00)

Source: CGMFPMFED, Head Office, Shankar Nagar, Raipur

3.2 Selection of Blocks

Bastar district has seven development blocks namely Bakawand, Bastar, Bastanar, Darbha, Jagdalpur, Lohandiguda and Tokapal. Out of these seven blocks three blocks namely Bakawand, Darbha and Jagdalpur were selected purposively for the present study.

3.3 Selection of Villages

Two villages from each block were selected for the study. From Bakawand Block Kolawal and Chhindgaon villages, from Jagdalpur Block Puspal and Bamhni villages and from Darbha Block Kotwarpara (Hamlet village of Tirathgarh) and Koleng villages were selected for the study. A total of six villages have been selected randomly.

3.4 Selection of respondents (NTFP Collectors):

Ten respondents (NTFPs collectors) were selected randomly from each of the selected villages. Thus a total of 60 respondents were selected.

3.5 Selection of Intermediaries:

In the process of marketing (buying, selling and processing) of Non-Timber Forest Products, the market functionaries are either Government agency, including Laghu Vanopaj Samiti through Self Help Groups (SHGs) and Private merchants, wholesaler, village level kochia (retailer) etc. are involved. Though, no official record is available in the market about the precise, number of wholesaler or commission agents and retailers involved in the NTFP marketing. Therefore three village level merchants along with two wholesalers at district level were selected randomly and interviewed for the purpose of calculating marketing costs, margins and processing charges involved. Information related to marketing of NTFPs was also collected from two Sanjivani Mart from Raipur and Jagdalpur city.

3.6 Period of Enquiry:

The process of detailed enquiry was performed from March to May in the year 2013 in Bastar district of Chhattisgarh.

3.7 Method of Enquiry and Data Collection:

Primary data was collected from the selected NTFP collectors through well prepared and tested schedule (Appendix-II). The data includes cost of different operations and manpower and time involved in collection, marketing and primary processing of different NTFPs at farm level and also financial help provided by the State Government and Forest Department. Data related to marketing and export of NTFPs from Government agencies like Sanjivani mart and Chhattisgarh Minor Forest Produce Co-operative Federation Limited were also collected.

3.8 Analytical Tools:

3. 8.1 Cost of Collection and Primary Processing:

To calculate cost involved in collection, marketing and primary processing of NTFPs, and to find out manpower and time involved, standard and suitable methods are adopted.

3. 8.2 Price Spread:

To calculate the price spread for NTFPs, various marketing channels of different length are selected and producer share in consumer rupees is also calculated.

3. 8.3 Relation of Farmer's Price, Marketing Cost and Consumer's Price

$$\text{FS}\ (\%) = \frac{(\text{RP} - \text{MC})}{\text{RP}} \times 100$$

Where,

FS = Farmer's Share in the Consumer Price Expressed as a Percentage

RP = Retail Price of the Commodity

MC = Marketing Cost including Margins

3. 8.4 Marketing cost and margin:

$C = C_f + Cm_1 + Cm_2 + Cm_3 + \ldots + Cmn$

Where,

C= Total marketing cost of producer

C_f= Cost paid by the farmer

Cm_1 = Cost incurred by i^{th} middleman

3. 8.5 Marketing margin of middleman:

1. Absolute margin (Ami)

   Ami = Pri – (PpiCmi)

2. Percentage margin (Pmi)

$$\text{Pm}i = \frac{\text{Pn}i - (\text{Ppi}_i + \text{Cm}i)}{\text{Pn}i} \times 100$$

3. Mark up margin (Mi):

$$\text{M}i = \frac{\text{Pri}_i - (\text{Ppi}_i + \text{Cmi}_i)}{\text{Ppi}_i} \times 100$$

Where,

Pri = Total value of receipts per unit.

Ppi = Purchase value of good per unit (purchase price).

Cmi = Cost incurred in purchase per unit.

3. 8.6 Producer price:

$P_f = P_f - C_f$

Where,

P_f = Net price received by the farmers / collectors

P_w = Wholesale price

C_f = Marketing cost incurred by the farmer / collectors

3.9 : General profile of study area

A research programme requires knowledge of the region in which the investigation in being carried out. Understanding the general characteristics of the study area in very essential to carry out the research. The study was confined to six villages of three blocks, Bakawand, Darbha and Jagdalpur, of Bastar District of Chhattisgarh. The selected villages represent appropriately well to the agro-climatic and socio-economic situation of Bastar District as well as Chhattisgarh.

To understand the general characteristics of the study area, a brief description about location, distribution of land holding, soil and topography, climate and rainfall, human population, land use pattern, water resources, transport and communication, profile of the studied villages, basic infrastructural facilities of the study area is presented in this chapter.

3.10 : General profile of Bastar District

Bastar district is situated between 19° 12' and 20° 34' North latitude and 81° 56' and 82° 15' East longitude with a varying elevation ranging from 1811 to 2000 ft.

The district has an area of 8755.79 km². Bastar District is bounded on the northwest by Rajnandgaon District, on the north by Kondagaon District, on the east by Navarangpur and Koraput districts of Orissa state, on the south and southwest by Dantewada District, and on the west by Gadchiroli District of Maharashtra state. Administratively, Bastar district is divided into seven development blocks including 331 villages.

3.11 Soil and topography :

The terrain of Bastar district is quite undulating because its elevation ranges from 325 meters to 578 meters from mean sea levels which is situated in the Bastar Plateau. Three types of soils viz. reddish clay soil, black soil and sandy soil are found here which are not very rich in humus and organic matter. They are generally in the acidic nature.

3.12 Climate and rainfall :

Bastar districts climate varies from humid to dry sub-humid climate like tropical climatic condition. The district has three distinct seasons viz. winter, summer and rainy. The district receives rainfall varies from 1095 mm to 1679.5 mm but average mean annual rainfall is 1424.3 mm with 65-75 rainy days and is received both by South West monsoon (75-80 %) and North East monsoon (10-15 %). Temperature of Bastar district in summer ranges from 38°C to 22°C with an average of 33.15°C and in winter it ranges from 26°C to 11°C with an average of 20.73°C.

Table 3.2: Monthly Rainfall distribution of Bastar District (2007–2011)

		Annual Rainfall (in mm.)				
S. No.	**Months**	**Year**				
		2007	**2008**	**2009**	**2010**	**2011**
1.	January	0.0	10.0	0.0	6.1	0.0
2.	February	15.3	18.2	0.0	3.1	29.1
3.	March	0.0	135.5	0.0	10.1	0.0
4.	April	13.5	17.7	0.0	36.0	50.4
5.	May	68.6	40.3	41.9	38.2	86.4
6.	June	337.0	183.9	117.6	133.1	120.4
7.	July	195.9	360.2	446.9	422.7	241.5
8.	August	377.4	380.5	315.5	436.8	292.3
9.	September	157.7	239.5	163.0	320.1	328.3
10.	October	93.8	11.8	46.0	151.5	12.0
11.	November	0.0	0.7	7.4	35.4	0.0
12.	December	0.0	0.0	0.0	30.1	0.1
	Total	**1259.2**	**1398.3**	**1138.3**	**1623.2**	**1160.5**

Source: Hydromet Division, Indian Meteorology Department, Bastar District

3.13 : Distribution of land holdings

The distribution of land in six selected villages of three selected blocks of Bastar district is presented in the Table 3.3. The distribution of land holding, according to the size of total cultivated area falling in each category is given below. The largest number of farm families falls under the category of small (38.33%) followed by medium (23.33%), marginal (21.67%) and large (16.67%).

Table 3.3: Village wise number of respondents and their farm sizein selected villages of Bastar District

S. No.	Size of holdings (in ha)	Bakawand Block		Jagdalpur Block		Darbha Block		Total
		Kolaval	Chhindgaon	Puspal	Bamhani	Kotvarpara	Koleng	
1.	Marginal (< 1 ha.)	3 (30.00)	3 (30.00)	1 (10.00)	2 (20.00)	2 (20.00)	2 (20.00)	13 (21.67)
2.	Small (1- 2 ha.)	3 (30.00)	3 (30.00)	7 (70.00)	3 (30.00)	3 (30.00)	4 (40.00)	23 (38.33)
3.	Medium (2-4 ha.)	2 (20.00)	2 (20.00)	1 (10.00)	4 (40.00)	3 (30.00)	2 (30.00)	14 (23.33)
4.	Large (> 4 ha.)	2 (20.00)	2 (20.00)	1 (10.00)	1 (10.00)	2 (20.00)	2 (10.00)	10 (16.67)
	Total	10 (100.00)	10 (100.00)	10 (100.00)	10 (100.00)	10 (100.00)	10 (100.00)	60 (100.00)

Source: Primary data collected through survey and Village Patwari of respective villages.

3.14: Land use pattern

Land use pattern of Bastar district is presented in table 3.4. The district has total geographical area of 8,75,579 hectare and out of the total geographical area, total forest area is 6,58,523 hectare which is more than 75 % of the total geographical area of the district. Only two percent area of the agricultural land is irrigated. Cropping intensity of the district is 124.60 %.

Table 3.4: Land use pattern of Bastar District

S. No.	Particulars	Bastar District (In hectare)	Percentage Share
1.	Total geographical area	875579	100.00
2.	Area under forest	516319	58.97
3.	Land under non-agricultural use	73350	8.38
4.	Barren and uncultivable land	47163	5.38
5.	Permanent pasture and other grazing land	14943	1.71
6.	Cultivable waste land	40766	4.65
7.	Fallow land	64686	7.39
8.	Net sown area	118352	13.52
9.	Gross cropped area	125453	14.32
10.	Double cropped area	2159	1.82
11.	Cropping intensity (%)	124.60	
12.	Irrigated area	6303	5.33

Source: District statistical booklet (2012), District planning and statistical office Jagdalpur (C. G.)

3.15: Water resources

Bastar district is rich in terms of water resources because it possesses two major river basins Indrāvati basin and Godavari basin which covers 5386.00 sq km area. The ground water level is also good in the district with net annual ground water availability is 18.17 Billion Cubic Meter (BCM) and net ground water availability for future irrigation development is 16.88 BCM. In spite of that 97.27 percent area of the agricultural land is rainfed and rest 2.73 percent area is irrigated because existing gross ground water draft for irrigation is only 0.09 BCM.

Table 3.5: Irrigation sources of Bastar District

S. No.	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
1.	Canals	12	2.92	1.23
2.	Tanks	124	8.62	3.63
3.	Open wells	3055	5.29	2.23
4.	Bore wells	1000	77.64	32.66
5.	Lift irrigation schemes	-	-	-
6.	Micro irrigation schemes	-	-	-
7.	Other Sources	-	143.26	60.25
8.	Total Irrigated Area		237.73	100.00

Source: Irrigation Department, Bastar District, Jagdalpur

3.16: Population distribution and Demographic features

The demographic features are presented in table 3.6. The total population of Bastar district was 14,11,644 of which male and female were 6,97,359 and 7,14,285 respectively, of which 86.30% population is rural and rest 13.70% population is urban. The growth rate of population is 17.83 percent as compared to population as per 2001. Average literacy rate of Bastar district is 54.94 per cent in which 65.70 per cent male and 44.49 per cent female were literate. Urban literacy is quite high (82.32%) as compared to rural (50.37%). Sex ratio in Bastar district is 1024 female per 1000 male which is very high as compared to India's average national sex ratio of 940 (Census 2011).

Table 3.6: Demographic features of Bastar District

S. No.	Particulars	Bastar District
1.	Total population	14,11,644 (100)
a.	Male	6,97,359 (49.40)
b.	Female	7,14,285 (50.60)
c.	Rural	12,18,316 (86.30)
d.	Urban	1,93,328 (13.70)
2.	Sex ratio (Female / 1000 male)	1024
a.	Rural	1032
b.	Urban	979
3.	Literacy (District)	6,58,587 (54.94)
a.	Male	3,87,907 (65.70)
b.	Female	2,70,680 (44.49)
4.	Urban literacy rate (%)	82.32
a.	Male	89.42
b.	Female	75.11
5.	Rural literacy rate (%)	50.37
a.	Male	61.64
b.	Female	39.52
6.	Population density (per sq. km)	140
7.	Population growth rate (2001-2011)	17.83
8.	Percentage of district population to state population	5.53
9.	Total SC population of the District	38,679
10.	Total ST population of the District	8,66,488

Source: Census report 2011, Bastar District.

3.17: Basic infrastructural facilities

Detail of the basic infrastructure facilities available in the three study villages are presented in the Table 3.7. The basic infrastructure facilities are below average in the selected villages but the availability of non-timber forest products is quite adequate.

Table 3.7: Basic Infrastructural Facilities in selected villages

S. No.	Infrastructure Facility	Kolawal		Chhindgaon		Puspal		Bamhni		Kotwarpara		Koleng	
		Availability (Y/N)	No.	Availability (Y/N)	No.	Availability (Y/N)	No.	Availability (Y/N)	No.	Availability (Y/N)	No.	Availability (Y/N)	No.
1.	Primary School	Y	2	Y	3	Y	2	Y	2	Y	1	Y	2
2.	Middle School	Y	2	Y	2	Y	2	Y	1	N	0	Y	1
3.	High School	N	0	N	0	Y	1	N	0	N	0	N	0
4.	College	N	0	N	0	N	0	N	0	N	0	N	0
5.	Hospital	N	0	Y	1	Y	1	N	0	N	0	N	0
6.	Post Office	N	0	Y	1	Y	1	N	0	N	0	N	0
7.	Road and Transport Facilities	Y	1	Y	1	Y	1	Y	1	N	0	N	0
8.	PACS	Y	1	Y	1	Y	1	Y	1	N	0	Y	1
9.	Regional Rural Banks	N	0	N	0	N	0	N	0	N	0	N	0
10.	Commercial Banks	N	0	N	0	N	0	N	0	N	0	N	0
11.	Forest Office	N	0	N	0	Y	1	N	0	N	0	N	0
12.	Agricultural Extension Services	N	0	N	0	N	0	N	0	N	0	N	0
13.	Cooperatives and SHGs	Y	7	Y	16	Y	6	Y	7	Y	6	Y	4
14.	Electricity	Y	1	Y	1	Y	1	Y	1	Y	1	Y	1
15.	Drinking Water	Y	1	Y	1	Y	1	Y	1	Y	1	Y	1
16.	Weekly Market	Y	1	Y	2	Y	1	Y	1	Y	1	Y	1

Source: Primary data collected from respective villages

3.18 Limitation of the study:

During the course of investigation several difficulties occurred in the collection of data from the collectors of non–timber forest products, as some of the details of collected, processed and marketed quantity of non–timber forest products are not properly maintained through records but on their memory basis, which may not be appropriately absolutely correct. Low level of education and knowledge of the respondents also added to the problems. The biasness of some of the respondents were also problematic for the study as some deliberately told high expenditure and low income and capital, however, cross checking with their literate neighbors also done.

RESULTS AND DISCUSSION

CHAPTER – IV

RESULTS AND DISCUSSION

This chapter includes collection, consumption, primary processing and marketing performances of the major non-timber forest products (NTFPs) in Bastar district of Chhattisgarh state. It also includes patterns of collection of and marketing patterns of major NTFPs along with the major constraints faced by the collectors in the collection, primary processing and marketing of the NTFPs. For convenience, the present chapter has been broadly discussed under following sub headings:

4.1 General characteristics of sample households.

4.2 Economics of collection, consumption, primary processing and marketing of major NTFPs in selected households.

4.3 Pattern of collection of NTFPs by the members of families in selected households.

4.4 Income distribution of selected households.

4.5 Marketing channel, marketing cost and price spread of major NTFPs.

4.6 Processing and value addition of major NTFPs at primary collector level.

4.7 Constraints in collection, primary processing and marketing of NTFPs.

4.1 General characteristics of sample households.

General characteristics of the sample households are presented in table 4.1, which shows that the average family size was 5.70 and there is not much difference in terms of size of families between different farmers group. The literacy rate was quite healthy i.e. 63.08 per cent.

The average size of land holding was 2.02 hectares which varied from 0.71 hectare for marginal farmers to 4.51 hectares for large farmers. The average holding size for small and medium farmers was 1.38 hectares and 2.50 hectares respectively. The average cropping intensity was reported at 122.53 per cent of the sample households.

Table 4.1: General characteristics of sampled households

S. No.	Particulars	Farm Size				
		Marginal	**Small**	**Medium**	**Large**	**Overall**
1.	Total number of sample households	13	23	14	10	60
2.	Average holding size (ha.)	0.71	1.38	2.50	4.51	2.02
3.	Average family size	5.69	5.70	5.93	5.60	5.73
4.	Literacy					
a.	Illiterate	25 (33.78)	49 (37.04)	31 (37.35)	22 (39.29)	127 (36.92)
b.	Primary	19 (25.68)	34 (25.95)	14 (16.87)	11 (19.63)	78 (22.67)
c.	Middle	14 (18.92)	31 (23.66)	17 (20.48)	10 (17.86)	72 (20.93)
d.	High School / Secondary	14 (18.92)	12 (9.16)	14 (16.87)	10 (17.86)	50 (14.53)
e.	Graduate and above	2 (2.70)	5 (3.82)	7 (8.43)	3 (5.36)	17 (4.95)
	Total	74 (100.00)	131 (100.00)	83 (100.00)	56 (100.00)	344 (100.00)
5.	Age group (years)					
a.	Up to 14 (Children)	29 (39.19)	45 (34.35)	23 (27.71)	17 (30.36)	114 (33.14)
b.	15 – 30	19 (25.68)	41 (31.30)	29 (34.94)	17 (30.36)	106 (30.81)
c.	31 – 55	23 (31.08)	36 (27.48)	26 (31.33)	16 (28.57)	101 (29.36)
d.	56 and above	3 (4.05)	9 (6.87)	5 (6.02)	6 (10.71)	23 (6.69)
	Total	74 (100.00)	131 (100.00)	83 (100.00)	56 (100.00)	344 (100.00)
6.	Cropping intensity (%)	109.52	131.64	118.23	138.72	122.53

Note: Figures in parenthesis indicates percentage to total

4.2 Economics of collection, consumption, primary processing and marketing of major NTFPs in selected households.

Collection of non-timber forest products in terms of total quantity collected per household was found to be inversely related with the farm size groups. On an average 886.07 Kg. NTFPs including edible and non-edible NTFPs was collected by

the selected households. The quantity consumed shows increasing trend as the size of farm increase but the large farmer's consumption decreases both quantity and percent wise. On an average 37.12 Kg. (4.18 per cent) NTFPs were consumed by the selected households from the total quantity collected and rest of the quantity was sold in the market. The quantity of NTFPs primarily processed at the farm level shows decreasing trend as the increase in the size of farm. On an average 462.29 Kg. (55.57 per cent) NTFPs were primarily processed at farm level. The primary processing of NTFPs fetches better and higher value for their NTFPs compared to the unprocessed NTFPs.

4.2.1 Collection of Non-Timber Forest Products:

It can be seen from table 4.2 that on an average, Sal Seed was the most prominently collected NTFPs with 272.25 Kg. (30.73 per cent) per household followed by Mahua Flower at 211.17 Kg. (23.83 per cent), Tamarind at 184.22 Kg. (20.80 per cent) and Tendu leaves at 60.25 Kg. (6.80 per cent). The lowest share in collection is contributed by Honey at 6.45 (0.73 per cent) followed by Kalmegh at 0.23 Kg. (0.03 per cent) to the total quantity of NTFPs collected per household.

4.2.2 Consumption of Non-Timber Forest Products:

It has been presented in table 4.2 that on an average consumption of Mushroom (Wild and Edible) was found highest as compared to other NTFPs being at 40.44 per cent followed by Honey at 22.94 per cent whereas, consumption of other NTFPs was found very low. Some of the NTFPs were non-edible viz. Sal Seed, Tendu Leaves, Harra, Baheda, Karanj Seed and Kalmegh.

4.2.3 Primary Processing of Non-Timber Forest Products:

It can be seen in table 4.2 that on an average processing of NTFPs at farm level, Sal Seed, Mahua Seed and Karanj Seed were found 100 percent as they all require de-shelling followed by sun drying to be sold in the market. Amongst other

NTFPs which either can be sold without processing but still processed, to fetch higher selling price, were Chironjee at 99.39 per cent followed by Tamarind at 61.89 per cent and rest of the NTFPs were only sun dried.

4.2.4 Selling of Non-Timber Forest Products:

Further the table 4.2 also shows that on an average out of the total collected NTFPs, 95.82 per cent was sold in the market. Amongst the NTFPs in all four categories of farm sizes viz. marginal, small, medium and large, the selling of NTFPs like Sal seed, Tendu leaves, Harra, Baheda, Karanj seed and Kalmegh were sold cent-per-cent followed by Mahua seed, Tamarind, Chironjee and Mahua flower.

4.2.5 Income generated through selling of NTFPs:

Table 4.2 shows, on an average Rs. 20258.69 per household were generated through the selling of NTFPs. Amongst the NTFPs Tendu leaves contributes 32.71 per cent followed by Mahua flower, Tamarind, Sal seed, Honey, Chironjee and Wild Mushroom at 16.62 per cent, 16.61 per cent, 9.55 per cent, 8.30 per cent, 4.35 per cent and 3.55 per cent respectively. The lowest income was generated through Kalmegh 137.50 (0.68 per cent).

4.2.6 Employment generated through collection of NTFPs:

Table 4.2 shows that the per household average number of collection days for NTFPs were 132 man days, out of those Tendu leaves generated highest employment days i.e. 25 man days followed by Sal seed, Mahua flower, Wild Mushroom and Mahua seed generated 18, 15, 15, and 12 man days of active employment.

4.2.7 Category wise collection of NTFPs:

The highest quantity of NTFPs was collected by marginal category of farmers with 938.56 Kg. per family followed by small farmers, medium farmers and large farmers with 923.30, 914.10 and 722.88 Kg. of NTFPs collections.

Table 4.3 shows that the per household collection of NTFPs by marginal farmers was dominated by Sal Seed with 30.45 per cent followed by Mahua flower,

Tamarind and Tendu leaves with 23.97, 20.45 and 8.65 per cent respectively. The least collected NTFPs were Honey and Kalmegh with 0.65 and 0.02 per cent respectively.

Table 4.4 shows that the per household collection of NTFPs by small farmers was lead by Sal Seed with 29.85 per cent followed by Mahua flower, Tamarind and Tendu leaves with 24.39, 20.60 and 7.25 per cent respectively. The NTFPs with lowest collection were Chironjee and Kalmegh with 0.66 and 0.03 per cent respectively.

Table 4.5 shows that the per household collection of NTFPs by medium farmers was largely contributed by Sal Seed with 32.59 per cent followed by Mahua flower, Tamarind and Mahua seed with 24.50, 17.03 and 6.91 per cent respectively. The NTFPs with least contribution in collection were Honey and Kalmegh with 0.71 and 0.03 per cent respectively.

Table 4.6 shows that the per household collection of NTFPs by large farmers was predominated by Sal Seed with 29.19 per cent followed by Tamarind, Mahua flower and Harra with 27.81, 19.78 and 7.47 per cent respectively. The NTFPs with lowest collection were Chironjee and Kalmegh with 0.28 and 0.02 per cent respectively.

4.2.8 Category wise consumption of NTFPs:

As far as the consumption of NTFPs has concern the quantity decreases as the size of farm increases from 3.93 per cent of marginal farmer to 5.19 per cent of medium farmer but the average consumption of large farmer decreases with 3.75 per cent.

The per household consumption of NTFPs by marginal farmers was lead by Mushroom with 40.96 per cent out of the total collection followed by Chironjee and Honey with 21.63 and 21.30 per cent respectively. The edible NTFP least consumed found out was Tamarind with 5.61 per cent.

Table 4.2: Average collection, consumption, primary processing and selling of Non-Timber Forest Products of Selected household

S. No.	Name of NTFPs	Quantity collected (Kg.)	Quantity consumed (Kg.)	Quantity sold (Kg.)	Quantity processed (Kg.)	Selling price of NTFPs (Rs. / Kg.)	Income generated through NTFPs (Rs.)	Employment days involved in collection of NTFPs
1.	Mahua Flower	211.17 (23.83)	16.25 (7.69)	194.92 (92.31)	00.00 (00.00)	17.13	3367.25 (16.62)	15 (11.37)
2.	Mahua Seed (Stone)	43.25 (4.88)	1.23 (2.84)	42.02 (97.16)	43.25 (100.00)	7.33	453.67 (2.24)	12 (9.09)
3.	Sal Seed	272.25 (30.73)	00.00 (00.00)	272.25 (100.00)	272.25 (100.00)	6.90	1934.58 (9.55)	18 (13.64)
4.	Tamarind	184.33 (20.80)	12.23 (6.69)	172.10 (93.31)	114.08 (61.89)	18.08	3362.67 (16.61)	5 (3.79)
5.	Tendu Leaves	60.25 (6.80)	00.00 (00.00)	60.25 (100.00)	00.00 (00.00)	110.00	6627.50 (32.71)	25 (18.94)
6.	Mushroom (Wild & Edible)	10.46 (1.18)	4.23 (40.44)	6.23 (59.56)	00.00 (00.00)	72.75	720.00 (3.55)	15 (11.37)
7.	Chironjee	8.18 (0.92)	1.60 (19.56)	6.58 (80.44)	8.13 (99.39)	53.33	880.67 (4.35)	5 (3.79)
8.	Harra	43.75 (4.94)	00.00 (00.00)	43.75 (100.00)	00.00 (00.00)	7.50	437.50 (2.16)	10 (7.57)
9.	Baheda	21.17 (2.39)	00.00 (00.00)	21.17 (100.00)	00.00 (00.00)	9.85	369.58 (1.82)	10 (7.57)
10.	Honey	6.45 (0.73)	1.48 (22.94)	4.97 (77.06)	00.00 (00.00)	213.33	1681.67 (8.30)	10 (7.57)
11.	Karanj Seed	24.58 (2.77)	00.00 (00.00)	24.58 (100.00)	24.58 (100.00)	6.60	286.00 (1.41)	5 (3.79)
12.	Kalmegh	0.23 (0.03)	00.00 (00.00)	0.23 (100.00)	00.00 (00.00)	200.00	137.50 (0.68)	2 (1.51)
	Total	**886.07 (100.00)**	**37.02 (4.18)**	**849.05 (95.82)**	**462.29 (55.57)**		**20258.59 (100.00)**	**132 (100.00)**

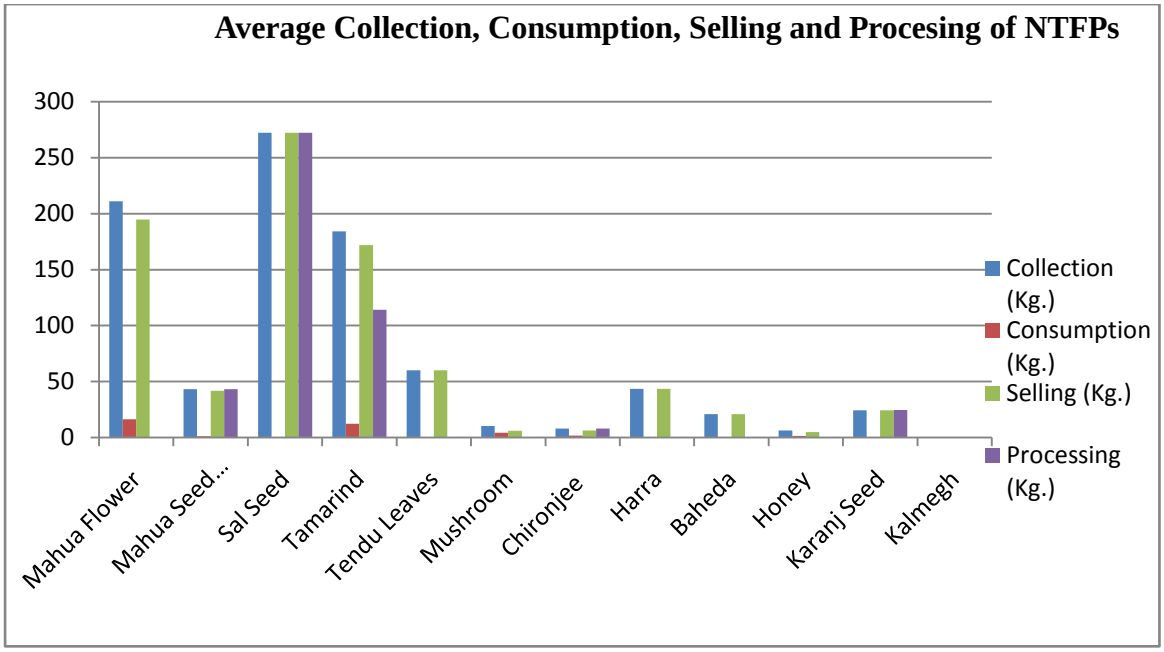


Fig. 4.1: Average collection, consumption, selling and processing of NTFPs of selected households.

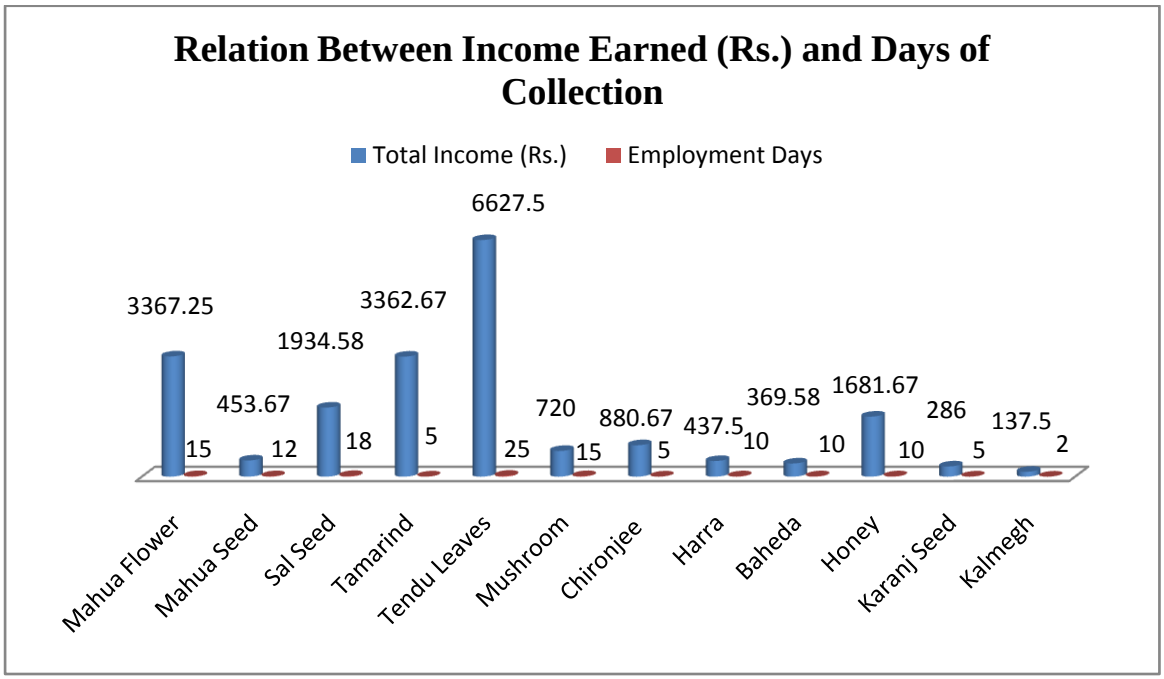


Fig. 4.2: Income generated and Employment day's relation of NTFPs of selected households.

Per household consumption of NTFPs by small farmers was dominated by Mushroom with 40.53 per cent out of the total collection followed by Honey and Chironjee with 20.50 and 16.31 per cent respectively.

Per household consumption of NTFPs by medium farmers was lead by Mushroom with 38.76 per cent out of the total collection followed by Honey and Chironjee with 24.12 and 22.96 per cent respectively.

The per household consumption of NTFPs by large farmers was lead by Mushroom with 43.10 per cent out of the total collection followed by Honey and Chironjee with 32.65 and 25.00 per cent respectively. The edible NTFP least consumed found out was Tamarind with 6.96 per cent.

4.2.9 Category wise processing of NTFPs:

Marginal category of farmer process about 57.36 per cent of total NTFPs collected followed by large farmer, medium farmer and small farmer with 56.98, 54.18 and 52.81 per cent respectively.

4.2.10 Category wise selling of NTFPs:

About 95.82 per cent of the total NTFPs were sold in the market by the selected households. Large farmer sells 96.25 per cent of the total collection followed by marginal, small and medium farmer with 96.07, 95.89 and 94.81 per cent of the total NTFPs collection.

4.2.11 Category wise income generation through selling of NTFPs:

Income generated through NTFPs by all the categories of farm sizes viz. marginal, small, medium and large on an average shows decreasing trend. Marginal farmer gain highest income i.e. Rs. 25566.89, through NTFPs selling followed by small, medium and large farmers with Rs. 21423.32, Rs. 19273.42 and Rs. 14587.50

per annum. It is clear from the table that income from NTFPs shows inverse relationship with the size of farms.

For marginal farmers per household income generated through NTFPs lead by Tendu leaves with 37.88 per cent followed by Mahua flower, Tamarind and Sal seed with 15.51, 14.42 and 8.61 per cent respectively. The lowest contribution in income was seen by Karanj seed and Kalmegh with 0.79 and 0.46 per cent respectively.

Per household income generated through NTFPs by small farmers was lead by Tendu leaves with 34.38 per cent followed by Mahua flower, Tamarind, Sal seed and Honey with 16.73, 15.94, 9.21 and 9.01 per cent respectively. The lowest contribution in income was seen by Karanj seed and Kalmegh with 1.09 and 0.65 per cent.

For medium farmers per household income generated through NTFPs was predominated by Tendu leaves with 29.35 per cent followed by Mahua flower, Tamarind and Sal seed with 17.13, 14.85 and 10.83 per cent respectively.

For medium farmers per household income generated through NTFPs was predominated by Tendu leaves with 29.35 per cent followed by Mahua flower, Tamarind and Sal seed with 17.13, 14.85 and 10.83 per cent respectively.

Per household income generated through NTFPs by large farmer shows that Tamarind contributed 26.74 per cent income followed by Tendu leaves Mahua flower, and Sal seed with 22.62, 17.71 and 10.39 per cent respectively.

Table 4.3: Collection, consumption, primary processing and selling of non-timber forest products of marginal farmers

S. No.	Name of NTFPs	Quantity collected (Kg.)	Quantity consumed (Kg.)	Quantity sold (Kg.)	Quantity processed (Kg.)	Selling price of NTFPs (Rs. / Kg.)	Income generated through selling of NTFPs (Rs.)	Employment days involved in collection of NTFPs
1.	Mahua Flower	225.00 (23.97)	12.69 (5.64)	212.31 (94.36)	00.00 (00.00)	17.54	3656.15 (15.51)	18 (11.69)
2.	Mahua Seed (Stone)	40.77 (4.34)	3.43 (8.41)	37.34 (91.59)	40.77 (100.00)	9.08	448.46 (1.90)	15 (9.74)
3.	Sal Seed	285.77 (30.45)	00.00 (00.00)	285.77 (100.00)	285.77 (100.00)	7.15	2028.07 (8.61)	20 (12.99)
4.	Tamarind	191.92 (20.45)	10.77 (5.61)	181.15 (94.39)	114.61 (90.14)	16.54	3395.77 (14.42)	10 (6.49)
5.	Tendu Leaves	81.15 (8.65)	00.00 (00.00)	81.15 (100.00)	00.00 (00.00)	110.00	8926.92 (37.88)	25 (16.23)
6.	Mushroom (Wild & Edible)	12.77 (1.36)	5.23 (40.96)	7.54 (59.04)	00.00 (00.00)	86.54	863.84 (3.66)	16 (10.39)
7.	Chironjee	16.00 (1.70)	3.46 (21.63)	12.54 (78.37)	12.54 (78.38)	100.38	1611.54 (6.84)	8 (5.19)
8.	Harra	37.31 (3.97)	00.00 (00.00)	37.31 (100.00)	00.00 (00.00)	6.92	373.07 (1.58)	12 (7.79)
9.	Baheda	25.77 (2.76)	00.00 (00.00)	25.77 (100.00)	00.00 (00.00)	10.38	383.85 (1.63)	12 (7.79)
10.	Honey	6.15 (0.65)	1.31 (21.30)	4.84 (78.70)	00.00 (00.00)	203.84	1584.61 (6.72)	11 (7.15)
11.	Karanj Seed	15.77 (1.68)	00.00 (00.00)	15.77 (100.00)	15.77 (100.00)	4.54	186.15 (0.79)	5 (3.25)
12.	Kalmegh	0.18 (0.02)	00.00 (00.00)	0.18 (100.00)	00.00 (00.00)	184.61	108.46 (0.46)	2 (1.30)
	Total	**938.56 (100.00)**	**36.89 (3.93)**	**901.67 (96.07)**	**496.46 (57.36)**		**23566.89 (100.00)**	**154 (100.00)**

Table 4.4: Collection, consumption, primary processing and selling of non-timber forest products of small farmers

S. No.	Name of NTFPs	Quantity collected (Kg.)	Quantity consumed (Kg.)	Quantity sold (Kg.)	Quantity processed (Kg.)	Selling price of NTFPs (Rs. / Kg.)	Income generated through NTFPs (Rs.)	Employment days involved in collection of NTFPs
1.	Mahua Flower	225.22 (24.39)	16.74 (7.43)	208.48 (92.57)	00.00 (00.00)	16.26	3584.78 (16.73)	14 (11.20)
2.	Mahua Seed (Stone)	45.43 (4.92)	2.41 (5.30)	43.02 (94.70)	45.43 (100.00)	7.48	498.48 (2.33)	10 (8.00)
3.	Sal Seed	275.65 (29.85)	00.00 (00.00)	275.65 (100.00)	275.65 (100.00)	6.87	1971.30 (9.21)	22 (17.60)
4.	Tamarind	190.22 (20.60)	12.05 (6.33)	178.17 (93.67)	108.91 (57.25)	18.91	3415.30 (15.94)	5 (4.00)
5.	Tendu Leaves	66.95 (7.25)	00.00 (00.00)	66.95 (100.00)	00.00 (00.00)	110.00	7365.00 (34.38)	21 (16.80)
6.	Mushroom (Wild & Edible)	10.61 (1.15)	4.30 (40.53)	6.31 (59.47)	00.00 (00.00)	75.22	729.13 (3.40)	13 (10.40)
7.	Chironjee	6.13 (0.66)	1.00 (16.31)	5.13 (83.69)	5.13 (83.69)	47.82	716.08 (3.34)	5 (4.00)
8.	Harra	49.56 (5.37)	00.00 (00.00)	49.56 (100.00)	00.00 (00.00)	7.83	495.65 (2.31)	9 (7.20)
9.	Baheda	25.43 (2.75)	00.00 (00.00)	25.43 (100.00)	00.00 (00.00)	9.48	344.35 (1.61)	9 (7.20)
10.	Honey	7.22 (0.78)	1.48 (20.50)	5.74 (79.50)	00.00 (00.00)	232.61	1930.43 (9.01)	10 (8.00)
11.	Karanj Seed	20.65 (2.25)	00.00 (00.00)	20.65 (100.00)	20.65 (100.00)	5.47	234.56 (1.09)	5 (4.00)
12.	Kalmegh	0.23 (0.03)	00.00 (00.00)	0.23 (100.00)	00.00 (00.00)	182.61	138.26 (0.65)	2 (1.60)
	Total	**923.30 (100.00)**	**37.97 (4.11)**	**885.33 (95.89)**	**455.77 (52.81)**		**21423.32 (100.00)**	**125 (100)**

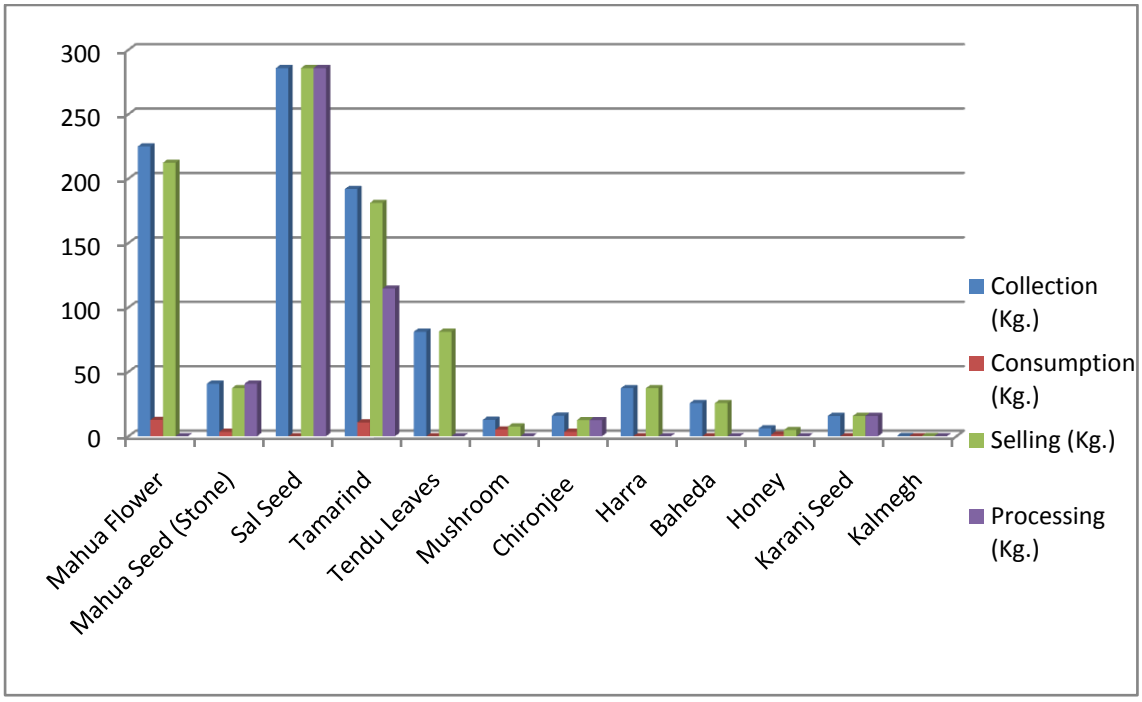


Fig. 4.3: Average collection, consumption, selling and processing of NTFPs for marginal farms.

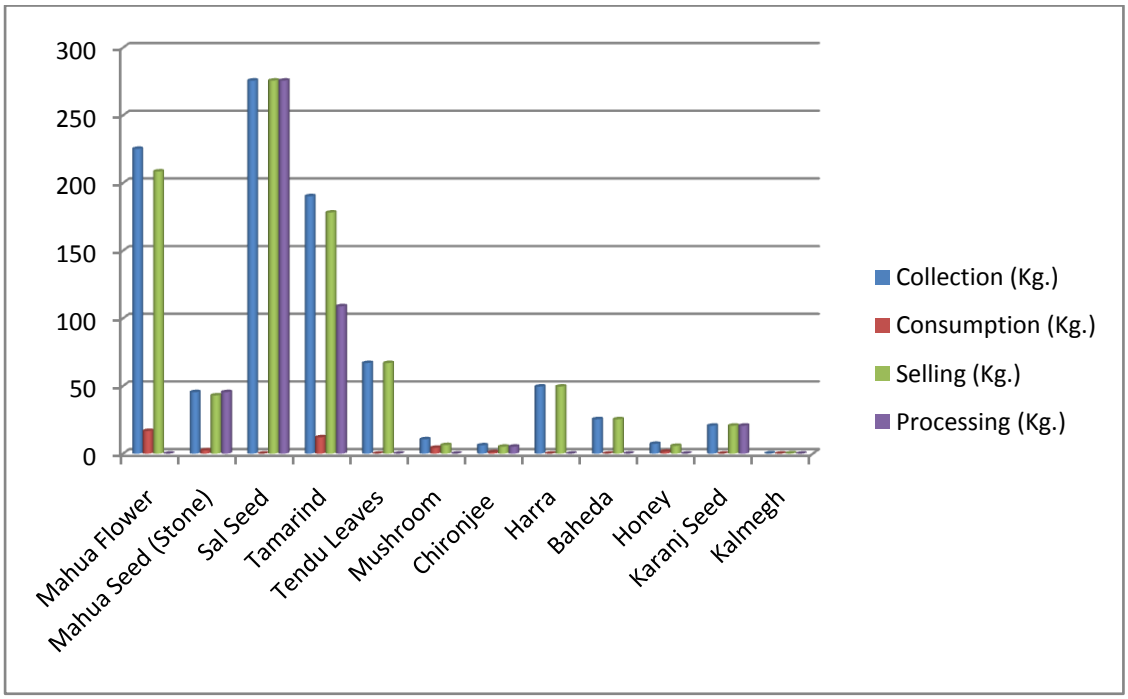


Fig. 4.4: Average collection, consumption, selling and processing of NTFPs for small farms.

Table 4.5: Collection, consumption, primary processing and selling of non-timber forest products of medium farmers

S. No.	Name of NTFPs	Quantity collected (Kg.)	Quantity consumed (Kg.)	Quantity sold (Kg.)	Quantity processed (Kg.)	Selling price of NTFPs (Rs. / Kg.)	Income generated through NTFPs (Rs.)	Employment days involved in collection of NTFPs
1.	Mahua Flower	223.93 (24.50)	24.28 (10.84)	199.65 (89.16)	00.00 (00.00)	16.85	3301.07 (17.13)	14 (10.29)
2.	Mahua Seed (Stone)	63.21 (6.91)	2.54 (4.02)	60.67 (95.98)	63.21 (100.00)	9.46	610.36 (1.61)	12 (8.82)
3.	Sal Seed	297.86 (32.59)	00.00 (00.00)	297.86 (100.00)	297.86 (100.00)	7.00	2087.14 (10.83)	22 (16.18)
4.	Tamarind	155.71 (17.03)	12.64 (8.12)	143.07 (91.88)	105.00 (67.43)	16.14	2862.00 (14.85)	7 (5.15)
5.	Tendu Leaves	51.43 (5.64)	00.00 (00.00)	51.43 (100.00)	00.00 (00.00)	110.00	5657.14 (29.35)	22 (16.18)
6.	Mushroom (Wild & Edible)	11.43 (1.25)	4.43 (38.76)	7.00 (61.24)	00.00 (00.00)	82.14	802.86 (4.17)	14 (10.29)
7.	Chironjee	8.71 (0.95)	2.00 (22.96)	6.71 (77.04)	6.71 (77.04)	46.78	901.43 (4.68)	5 (3.68)
8.	Harra	32.86 (3.59)	00.00 (00.00)	32.86 (100.00)	00.00 (00.00)	7.14	328.57 (1.70)	11 (8.09)
9.	Baheda	27.14 (2.97)	00.00 (00.00)	27.14 (100.00)	00.00 (00.00)	9.28	394.64 (2.05)	11 (8.09)
10.	Honey	6.51 (0.71)	1.57 (24.12)	4.94 (75.88)	00.00 (00.00)	242.86	1725.00 (8.95)	10 (7.35)
11.	Karanj Seed	35.00 (3.83)	00.00 (00.00)	35.00 (100.00)	35.00 (100.00)	8.50	416.78 (2.16)	6 (4.41)
12.	Kalmegh	0.31 (0.03)	00.00 (00.00)	0.31 (100.00)	00.00 (00.00)	257.14	186.43 (0.97)	2 (1.47)
	Total	**914.10 (100.00)**	**47.46 (5.19)**	**866.64 (94.81)**	**470.21 (54.18)**		**19273.42 (100.00)**	**136 (100)**

Table 4.6: Collection, consumption, primary processing and selling of non-timber forest products of large farmers

S. No.	Name of NTFPs	Quantity collected (Kg.)	Quantity consumed (Kg.)	Quantity sold (Kg.)	Quantity processed (Kg.)	Selling price of NTFPs (Rs. / Kg.)	Income generated through NTFPs (Rs.)	Employment days for collection of NTFPs
1.	Mahua Flower	143.00 (19.78)	8.50 (5.94)	134.50 (94.06)	00.00 (00.00)	19.00	2584.00 (17.71)	11 (9.73)
2.	Mahua Seed (Stone)	13.50 (1.87)	00.00 (00.00)	13.50 (100.00)	13.50 (100.00)	4.15	138.00 (0.95)	8 (7.08)
3.	Sal Seed	211.00 (29.19)	00.00 (00.00)	211.00 (100.00)	211.00 (100.00)	6.50	1515.00 (10.39)	18 (15.94)
4.	Tamarind	201.00 (27.81)	14.00 (6.96)	187.00 (93.04)	138 (68.66)	20.90	3899.50 (26.74)	8 (7.08)
5.	Tendu Leaves	30.00 (4.14)	00.00 (00.00)	30.00 (100.00)	00.00 (00.00)	110.00	3300.00 (22.62)	20 (17.70)
6.	Mushroom (Wild & Edible)	5.80 (0.80)	2.50 (43.10)	3.30 (56.90)	00.00 (00.00)	78.60	396.00 (2.71)	11 (9.73)
7.	Chironjee	2.00 (0.28)	00.50 (25.0)	1.50 (75.00)	2.00 (100.00)	54.00	210.00 (1.44)	4 (3.54)
8.	Harra	54.00 (7.47)	00.00 (00.00)	54.00 (100.00)	00.00 (00.00)	8.0	540.00 (3.70)	9 (7.96)
9.	Baheda	27.00 (3.74)	00.00 (00.00)	27.00 (100.00)	00.00 (00.00)	10.80	374.00 (2.56)	9 (7.96)
10.	Honey	4.90 (0.68)	1.60 (32.65)	3.30 (67.35)	00.00 (00.00)	356.06	1175 (8.05)	8 (7.08)
11.	Karanj Seed	30.50 (4.22)	00.00 (00.00)	30.50 (100.00)	30.50 (100.00)	9.20	351.00 (2.41)	5 (4.43)
12.	Kalmegh	0.18 (0.02)	00.00 (00.00)	0.18 (100.00)	00.00 (00.00)	180.00	105.00 (0.72)	2 (1.77)
	Total	**722.88 (100.00)**	**27.10 (3.75)**	**695.78 (96.25)**	**395.00 (56.98)**		**14587.50 (100.00)**	**113 (100.00)**

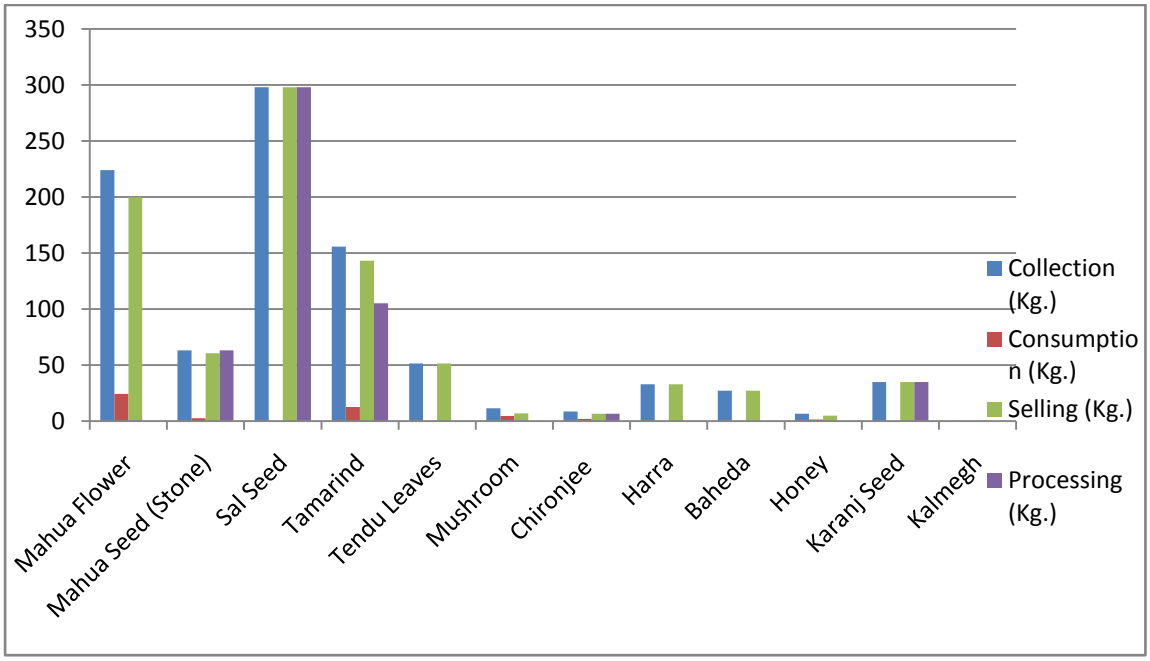


Fig. 4.5: Average collection, consumption, selling and processing of NTFPs for medium farms.

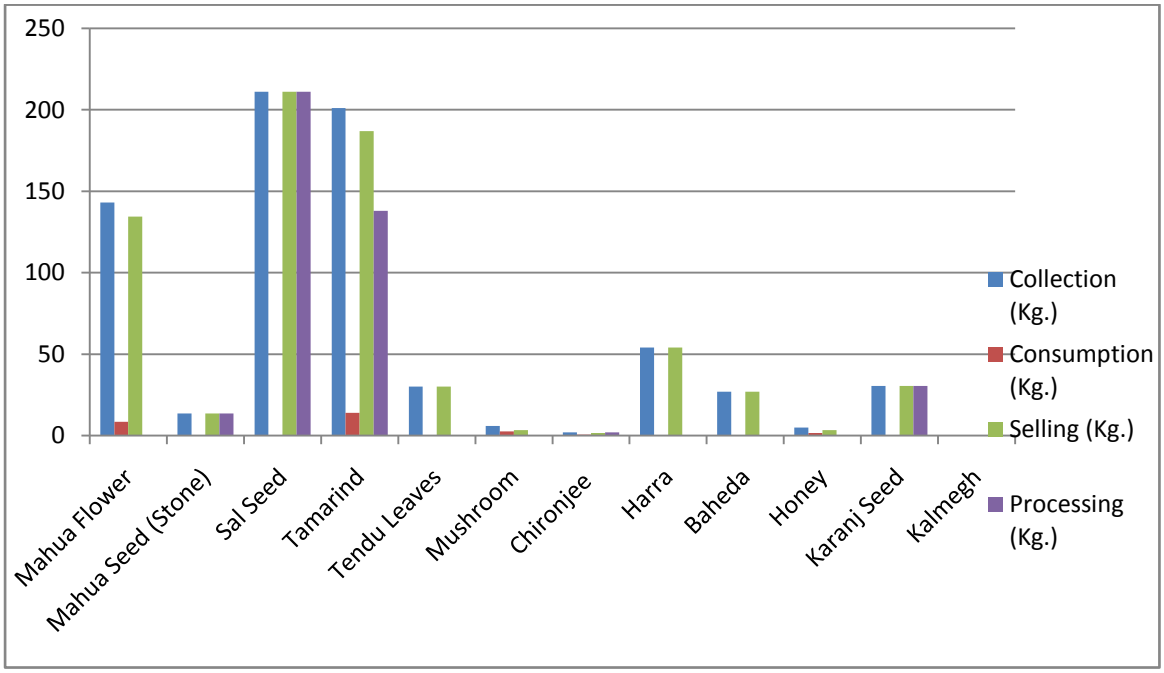


Fig. 4.6: Average collection, consumption, selling and processing of NTFPs for large farms.

4.3 Pattern of collection of NTFPs by the family members in selected households.

The overall pattern of collection, primary processing and marketing of NTFPs by the sampled households are presented in the table 4.7 which shows that the average collection days for NTFPs was 134.33 annually per household which is dominated by female collectors with 86.33 days followed by male and children at 30.58 and 17.42 days respectively. The average active hours of collection was reported 9.61 hours which yielded 26.05 Kg. of NTFPs per day of collection which was again leaded by female collectors with 5.75 hours and 14.73 Kg. per day of collection. It is seen that children are not at all involved in processing and marketing of NFPs. Average marketing of NTFPs is 53.60 Kg. per day per household which is done largely by male members with 72.44 per cent share followed by female at 27.56 per cent. Average processing of NTFPs is 43.19 Kg. per household lead by female collectors at 34.92 Kg. per day.

Table 4.7: Overall pattern of collection of Non-Timber Forest Products amongst selected households

S. No.	Particulars	Male	Female	Children	Total
1.	Average collection days in a year	30.58 (22.76)	86.33 (64.27)	17.42 (12.97)	134.33 (100.00)
2.	Active wage earning days in an year	24.50 (22.77)	71.67 (66.62)	11.41 (10.61)	107.58 (100.00)
3.	Active hours of work in a day	2.68 (27.89)	5.75 (59.83)	1.18 (12.28)	9.61 (100.00)
4.	Quantity collected / person / day (Kg.)	8.00 (30.71)	14.73 (56.55)	3.32 (12.74)	26.05 (100.00)
5.	Quantity processed / person / day (Kg.)	8.27 (19.15)	34.92 (80.85)	00.00 (00.00)	43.19 (100.00)
6.	Quantity marketed / person / day (Kg.)	38.83 (72.44)	14.77 (27.56)	00.00 (00.00)	53.60 (100.00)
7.	Income earned / person / day (Rs.)	11.63 (23.01)	33.17 (65.62)	5.75 (11.37)	50.55 (100.00)

Note: Figures in parenthesis indicates percentage to total

4.3.1 Category wise pattern of collection of NTFPs

The category wise collection pattern of NTFPs has been presented in table 4.8, which indicates that total number of collection days, active hours of collection, per head quantity collected in a day etc decreases as the farm size increases.

On an average 205.24 days were spend by marginal farm family per annum for the collection of NTFPs including 13.45 active hours of work per daywhich enabled them to collect 27.46 kg. of NTFPs per visit per household. Female member of the family spends more number of hours as well as days in the collection of NTFPs.

On an average 125.06 days were spend by small farm family per year for the collection of NTFPs which requires9.56 active hours of work per day which made them to collect 27.69 kg. of NTFPs per visit per household. On an average female member of the family spends 6.00 hours per day and83.26 days per year for the collection of NTFPs.

146.41 days spend by medium farm family per annum for the collection of NTFPs and10.00 active hours of work per day which enabled them to collect 25.56 kg. of NTFPs per visit per household.

On an average 113.50 days were spend by large farm family per annum for the collection of NTFPs and8.60 active hours of work per day which made them to collect 24.40 kg. of NTFPs per visit per household.

Table 4.8: Collection pattern of Non-Timber Forest Products amongst selected households

S. No.	Particulars	Marginal Farmer				Small Farmer				Medium Farmer				Large Farmer			
		M	F	C	T	M	F	C	T	M	F	C	T	M	F	C	T
1.	Average collection days in a year	48.89 (23.82)	103.85 (50.60)	52.50 (25.58)	205.24 (100.00)	20.28 (16.22)	83.26 (66.58)	21.52 (17.20)	125.06 (100.00)	48.57 (33.17)	83.92 (57.32)	13.92 (9.51)	146.41 (100.00)	25.0 (22.03)	74.00 (65.20)	14.50 (12.77)	113.50 (100.00)
2.	Active wage earning days in an year	40.00 (23.78)	86.92 (51.69)	41.25 (24.53)	168.17 (100.00)	15.65 (15.93)	68.48 (69.69)	14.13 (14.38)	98.26 (100.00)	38.93 (33.24)	70.71 (60.36)	7.50 (6.40)	117.14 (100.00)	20.50 (22.78)	60.50 (67.22)	9.00 (10.00)	90.00 (100.00)
3.	Active hours of work in a day	4.78 (35.54)	5.92 (44.01)	2.75 (20.45)	13.45 (100.00)	2.00 (20.92)	6.00 (62.76)	1.56 (16.32)	9.56 (100.00)	3.71 (37.10)	5.29 (52.90)	1.00 (10.00)	10.00 (100.00)	2.00 (23.26)	5.60 (65.12)	1.00 (11.62)	8.60 (100.00)
4.	Quantity collected / person / day	7.92 (29.05)	14.54 (52.95)	5.00 (18.20)	27.46 (100.00)	8.08 (29.19)	16.30 (58.87)	3.61 (13.04)	27.69 (100.00)	9.07 (35.49)	13.21 (51.68)	3.28 (12.83)	25.56 (100.00)	7.20 (29.51)	14.20 (58.20)	3.00 (12.29)	24.40 (100.00)
5.	Quantity processed / person / day	14.89 (28.15)	38.00 (71.85)	00.00 (00.00)	52.89 (100.00)	6.87 (16.49)	34.78 (83.51)	00.00 (00.00)	41.65 (100.00)	12.00 (25.89)	34.35 (74.11)	00.00 (00.00)	46.35 (100.00)	12.00 (27.27)	32.0 (72.73)	00.00 (00.00)	44.00 (100.00)
6.	Quantity marketed / person / day	43.33 (70.27)	18.33 (29.73)	00.00 (00.00)	61.66 (100.00)	36.30 (71.80)	14.26 (28.20)	00.00 (00.00)	50.56 (100.00)	37.86 (74.87)	12.71 (25.13)	00.00 (00.00)	50.57 (100.00)	44.50 (73.55)	16.00 (26.45)	00.00 (00.00)	60.50 (100.00)
7.	Income earned / person / day	23.11 (30.72)	34.62 (46.02)	17.50 (23.26)	75.23 (100.00)	7.95 (17.03)	32.82 (70.31)	5.91 (12.66)	46.68 (100.00)	16.36 (31.55)	31.07 (59.92)	4.42 (8.53)	51.85 (100.00)	7.80 (15.44)	35.00 (69.31)	7.70 (15.25)	50.50 (100.00)

Note: Figures in parenthesis indicates percentage to total

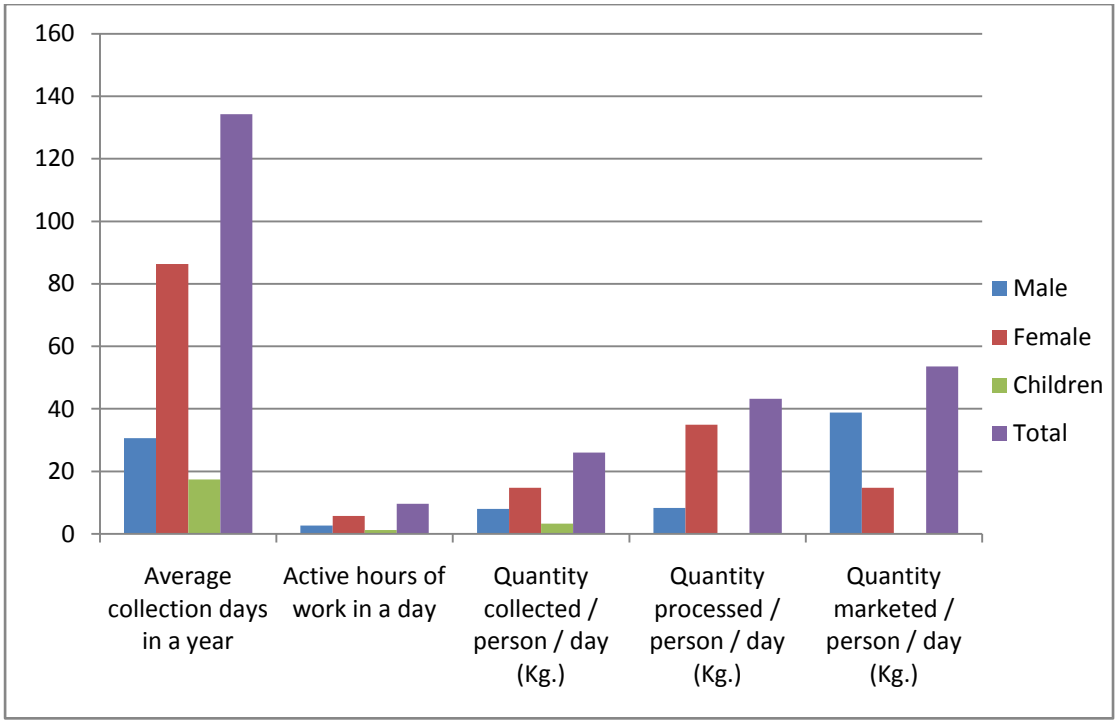


Fig. 4.7: Overall pattern of collection of NTFPs amongst selected households

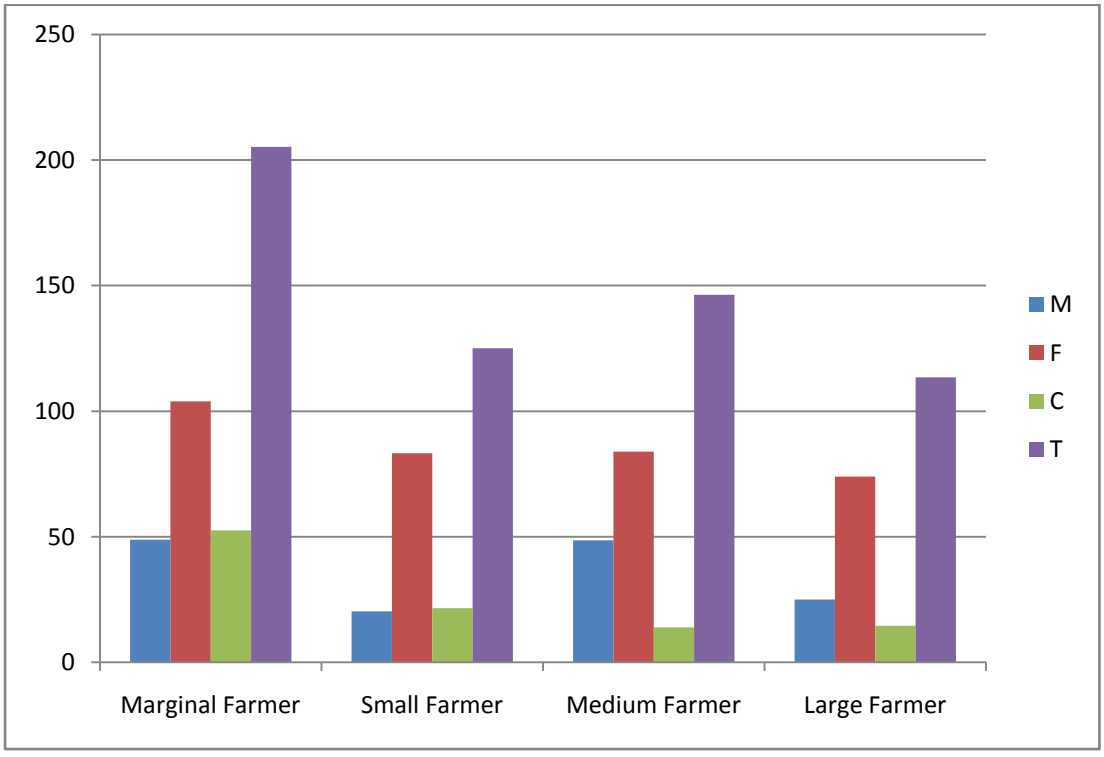


Fig. 4.8: Average collection days in a year for NTFPs by different farm size

4.4 Income distribution of sample household

It can be seen from table 4.9 that the average annual income per family per year for sampled household came to Rs. 71643.03 which was largely contributed by farm income with 58.44 per cent followed by non-farm income and off-farm income with 35.94 per cent and 5.62 per cent respectively. The contribution by NTFPs in the annual income was 18.15 per cent out of the total income.

On an average the annual income per family per year for marginal farmer was found Rs. 40000.75 which is largely contributed by non-farm income with 46.32 per cent followed by farm income and off-farm income with 41.85 and 10.83 per cent contribution. The contribution by NTFPs in annual income for marginal farmer was found highest amongst all categories with 37.74 per cent.

Table 4.9: Income distribution of sample household

(Rs. / Family / Year)

S. No.	Categories of Household	Source of Income					Total Household Income
		Farm	Off-farm	Non-farm			
				NTFPs	Others	Total	
1.	Marginal	17138.76 (42.85)	4332.55 (10.83)	15096.89 (37.74)	3432.55 (8.58)	18529.44 (46.32)	40000.75 (100.00)
2.	Small	29572.10 (50.36)	7845.52 (13.36)	13943.32 (23.74)	7364.26 (12.54)	21307.58 (36.28)	58725.20 (100.00)
3.	Medium	48410.91 (66.10)	345.36 (0.47)	12023.42 (16.42)	12456.39 (17.01)	24479.81 (33.43)	73236.08 (100.00)
4.	Large	93143.96 (66.93)	00.00 (00.00)	8372.50 (6.02)	37651.91 (27.05)	46024.41 (33.07)	139168.37 (100.00)
	Average	**41869.24 (58.44)**	**4026.75 (5.62)**	**12998.59 (18.15)**	**12748.49 (17.79)**	**25747.04 (35.94)**	**71643.03 (100.00)**

Note: Figures in parenthesis indicates percentage to total

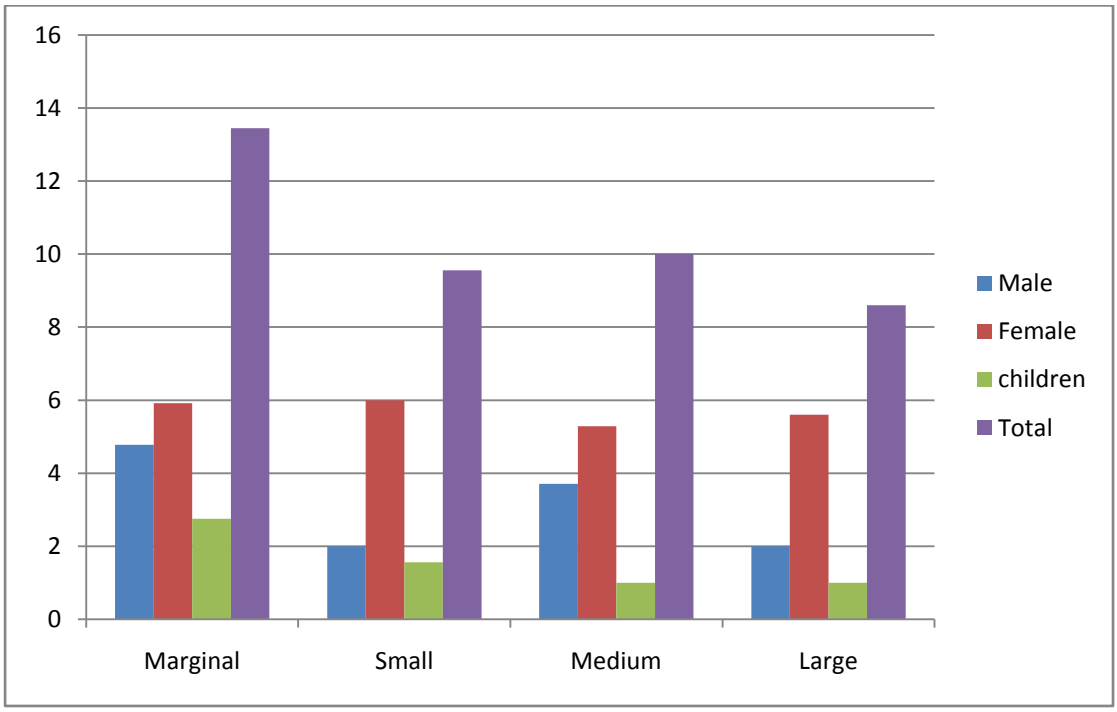


Fig. 4.9: Category wise collection hours spend by selected household

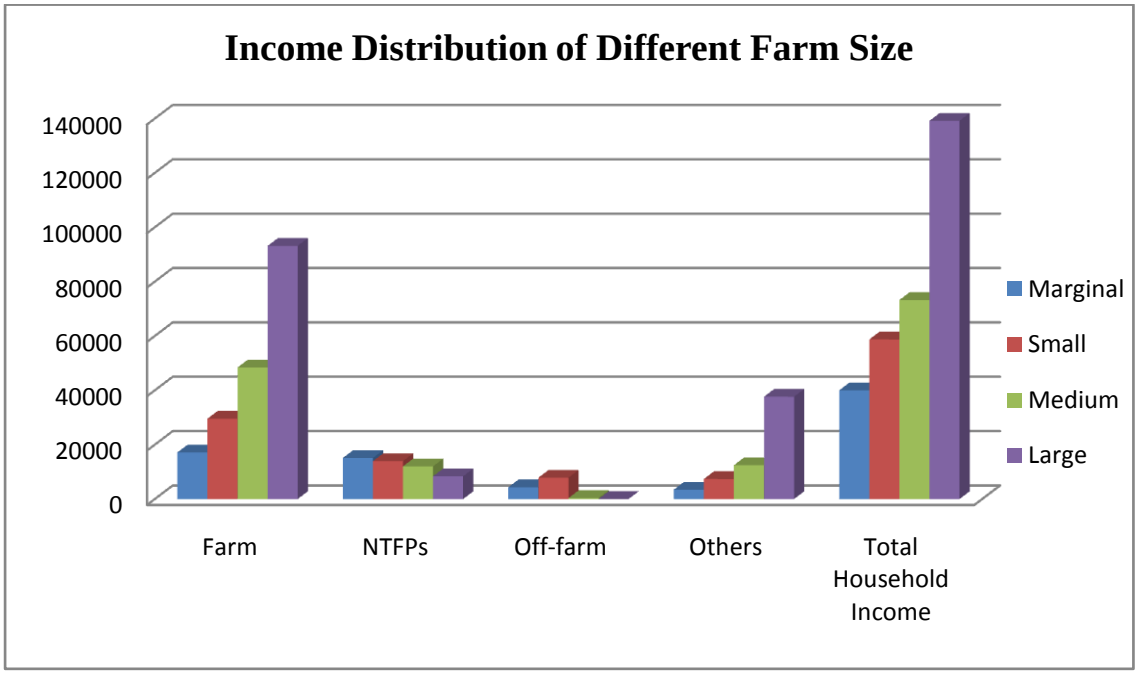


Fig. 4.10: Category wise income distribution of selected households

The average annual income per family per year for small farmer was found Rs. 58725.20 which is largely contributed by farm income with 50.36 per cent followed by non-farm income and off-farm income with 36.28 and 13.36 per cent contribution. The contribution by NTFPs in annual farmer was found 23.74 per cent.

The average annual income per family per year for medium farmer was found Rs. 73236.08 which is largely contributed by farm income with 66.10 per cent followed by non-farm income with 33.43 per cent. Contribution from off-farm income was quite low and negligible with 0.47 per cent. The contribution by NTFPs in annual farmer was found 16.42 per cent.

The average annual income per family per year for large farmer was Rs. 139168.37 which is largely contributed by farm income with 66.93 per cent followed by non-farm income with 33.07 per cent. There was no contribution from off-farm income in the annual income for large farmer. The contribution by NTFPs in annual farmer was only 6.02 per cent.

It is clear from the table 4.9 that the contribution of income generated through NTFPs in annual income of selected household shows inverse relationship with the size of farms.

4.5 Marketing channel, marketing cost and price spread of major NTFPs.

4.5.1 Disposable pattern of major NTFPs:

The disposable pattern of NTFPs in table 4.10 which shows that 54.01 per cent out of the sold quantities of NTFPs are traded to Minor Forest Produce Society (MFPS) followed by village merchant and directly to consumer with 35.37 and 10.62 per cent respectively. NTFPs like Sal seed, Tendu leaves and Kalmegh are only traded to Minor Forest Produce Society. In case of other edible NTFPs Chironjee, Honey and Tamarind are traded largely to Primary Minor Forest Produce Society with 62.92,

55.73 and 55.35 per cent respectively. Karanj seed, Baheda and Mahua flower are preferred to sell to the village level merchant (Kochia). Out of the total NTFPs traded 10.62 per cent directly reaches to the consumer without any mediator or commission agent.

Table 4.10: Overall disposal pattern of NTFPs of sample households

S. No.	Name of NTFPs	Quantity of NTFPs traded (Kg.)	Disposal pattern of NTFPs (%)		
			Consumers	Village Merchant	Minor Forest Produce Society
1.	Mahua Flower	194.92 (100.00)	46.52 (23.87)	148.40 (76.13)	00.00 (00.00)
2.	Mahua Seed (Stone)	42.02 (100.00)	9.66 (22.99)	20.88 (49.69)	11.48 (27.32)
3.	Sal Seed	272.25 (100.00)	00.00 (00.00)	00.00 (00.00)	272.25 (100.00)
4.	Tamarind	172.10 (100.00)	17.33 (10.07)	59.51 (34.58)	95.26 (55.35)
5.	Tendu Leaves	6.02 (100.00)	00.00 (00.00)	00.00 (00.00)	6.02 (100.00)
6.	Mushroom (Wild & Edible)	6.23 (100.00)	6.23 (100.00)	00.00 (00.00)	00.00 (00.00)
7.	Chironjee	6.58 (100.00)	2.44 (37.08)	0.00 (00.00)	4.14 (62.92)
8.	Harra	43.75 (100.00)	00.00 (00.00)	13.38 (30.58)	30.37 (69.42)
9.	Baheda	21.17 (100.00)	00.00 (00.00)	14.39 (69.97)	6.78 (32.03)
10.	Honey	4.97 (100.00)	2.20 (44.27)	00.00 (00.00)	2.77 (55.73)
11.	Karanj Seed	24.58 (100.00)	00.00 (00.00)	24.58 (100.00)	00.00 (00.00)
12.	Kalmegh	0.23 (100.00)	00.00 (00.00)	00.00 (00.00)	0.23 (100.00)
	Total	**794.82 (100.00)**	**84.38 (10.62)**	**281.14 (35.37)**	**429.30 (54.01)**

Note: Figures in parenthesis indicates percentage to total

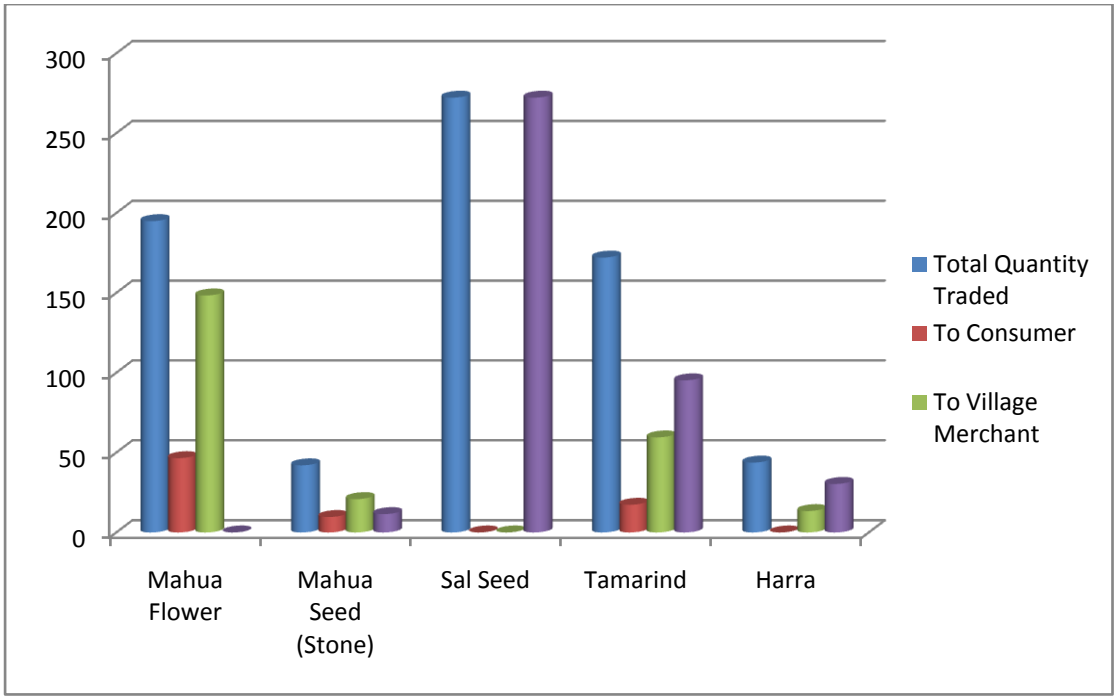


Fig. 4.11: Average Disposal of Major NTFPs amongst selected households.

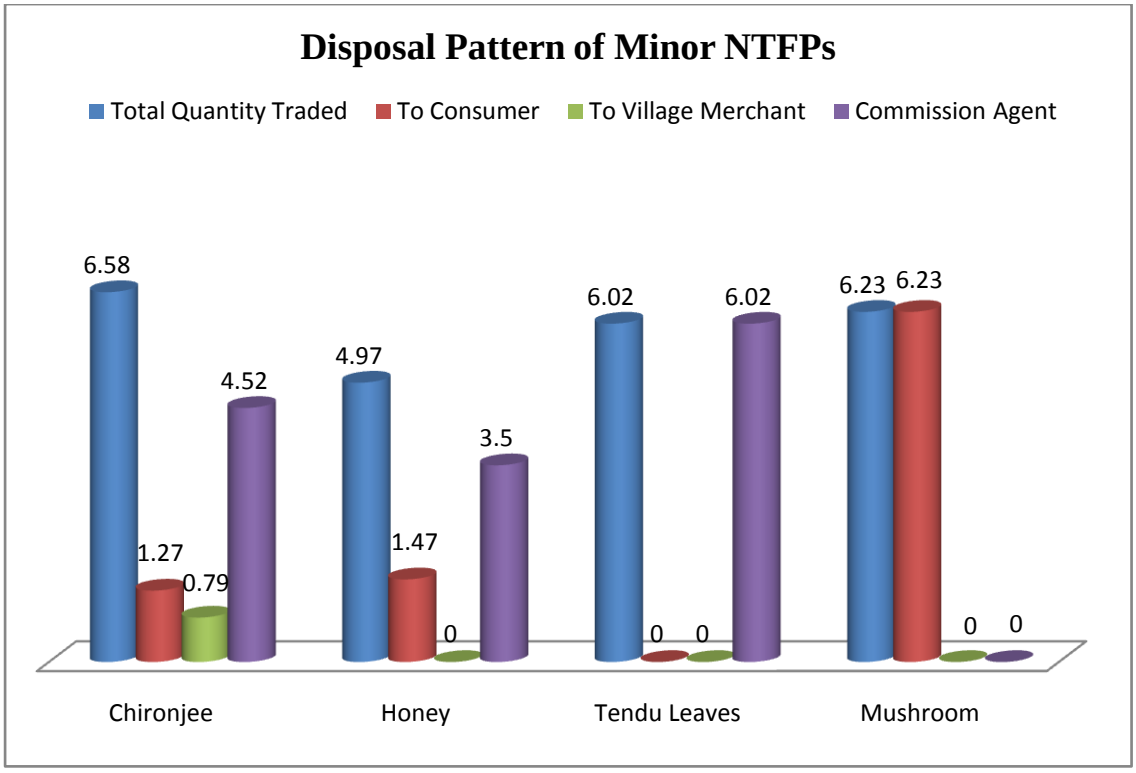


Fig. 4.12: Average Disposal of Minor NTFPs amongst selected households.

4.5.2 Category wise disposal pattern of major NTFPs

Quantity wise highest amounts of NTFPs were collected and marketed both by marginal farmers. Out of the total collection large farmer sells 96.25 per cent followed by marginal, small and medium farms with 96.07, 95.89 and 94.81 per cent respectively.

Table 4.11: Disposal pattern of major NTFPs by marginal farmers

S. No.	Name of NTFPs	Quantity of NTFPs traded (Kg.)	Disposal pattern of NTFPs (%)		
			Consumers	Village Merchant	Minor Forest Produce Society
1.	Mahua Flower	212.31 (100.00)	34.76 (16.37)	177.55 (83.63)	00.00 (00.00)
2.	Mahua Seed (Stone)	37.34 (100.00)	2.98 (7.98)	23.75 (63.61)	10.61 (28.41)
3.	Sal Seed	285.77 (100.00)	00.00 (00.00)	00.00 (00.00)	285.77 (100.00)
4.	Tamarind	181.15 (100.00)	23.92 (13.21)	72.12 (39.81)	85.11 (46.98)
5.	Tendu Leaves	81.15 (100.00)	00.00 (00.00)	00.00 (00.00)	81.15 (100.00)
6.	Mushroom (Wild & Edible)	7.54 (100.00)	7.54 (100.00)	00.00 (00.00)	00.00 (00.00)
7.	Chironjee	12.54 (100.00)	4.37 (34.85)	00.00 (00.00)	8.17 (65.15)
8.	Harra	37.31 (100.00)	00.00 (00.00)	13.32 (35.70)	23.99 (64.30)
9.	Baheda	25.77 (100.00)	00.00 (00.00)	13.88 (53.86)	11.89 (46.14)
10.	Honey	4.84 (100.00)	2.07 (42.77)	00.00 (00.00)	2.77 (57.23)
11.	Karanj Seed	15.77 (100.00)	00.00 (00.00)	15.77 (100.00)	00.00 (00.00)
12.	Kalmegh	0.18 (100.00)	00.00 (00.00)	00.00 (00.00)	0.18 (100.00)
	Total	**901.67 (100.00)**	**75.64 (8.39)**	**316.39 (35.09)**	**509.64 (56.52)**

Note: Figures in parenthesis indicates percentage to total

Table 4.11 shows that out of the total NTFPs marketed per household by marginal farmer 56.52 per cent were traded to the Minor Forest Produce Society followed by village merchant and consumer with 35.09 and 8.39 per cent respectively. Amongst the edible NTFPs 100 per cent quantity of Mushroom was sold directly to the consumer. Chironjee, Honey and Tamarind were largely traded to Primary Minor Forest Produce Society with 65.15, 57.23 and 46.98 per cent respectively.

The disposable pattern of NTFPs by small farmers is presented in table 4.12 which shows that out of the total marketed NTFPs 57.53 per cent were traded to Minor Forest Produce Society followed by village merchant and directly to consumer with 30.98 and 11.49 per cent respectively. Amongst edible NTFPs Chironjee was largely traded to Minor Forest Produce Society at 73.88 per cent followed by Tamarind and Honey with 65.62 and 40.59 per cent respectively. Amongst non-edible NTFPs Sal seed, Tendu leaves and Kalmegh were sold 100 per cent to Minor Forest Produce Society.

The disposal pattern of NTFPs by medium farmers reveals that out of the total NTFPs traded 54.08 per cent were traded to Minor Forest Produce Society followed by village merchant and directly to consumer with 37.80 and 8.12 per cent respectively. Amongst edible NTFPs Honey was largely traded to Minor Forest Produce Society at 73.08 per cent followed by Chironjee and Tamarind with 37.26 and 34.17 per cent respectively.

Table 4.12: Disposal pattern of major NTFPs by small farmers

S. No.	Name of NTFPs	Quantity of NTFPs traded (Kg.)	Disposal pattern of NTFPs (%)		
			Consumers	Village Merchant	Minor Forest Produce Society
1.	Mahua Flower	208.48 (100.00)	55.87 (26.80)	152.61 (73.20)	00.00 (00.00)
2.	Mahua Seed (Stone)	43.02 (100.00)	18.92 (43.98)	24.10 (56.02)	00.00 (00.00)
3.	Sal Seed	275.65 (100.00)	00.00 (00.00)	00.00 (00.00)	275.65 (100.00)
4.	Tamarind	178.17 (100.00)	15.88 (8.91)	45.38 (25.47)	116.91 (65.62)
5.	Tendu Leaves	66.95 (100.00)	00.00 (00.00)	00.00 (00.00)	66.95 (100.00)
6.	Mushroom (Wild & Edible)	6.31 (100.00)	6.31 (100.00)	00.00 (00.00)	00.00 (00.00)
7.	Chironjee	5.13 (100.00)	1.34 (26.12)	00.00 (00.00)	3.79 (73.88)
8.	Harra	49.56 (100.00)	00.00 (00.00)	13.95 (28.15)	35.61 (71.85)
9.	Baheda	25.43 (100.00)	00.00 (00.00)	17.54 (68.97)	7.89 (31.03)
10.	Honey	5.74 (100.00)	3.41 (59.41)	00.00 (00.00)	2.33 (40.59)
11.	Karanj Seed	20.65 (100.00)	00.00 (00.00)	20.65 (100.00)	00.00 (00.00)
12.	Kalmegh	0.23 (100.00)	00.00 (00.00)	00.00 (00.00)	0.23 (100.00)
	Total	885.32 (100.00)	**101.73 (11.49)**	**274.23 (30.98)**	**509.36 (57.53)**

Note: Figures in parenthesis indicates percentage to total

Table 4.43 shows that on an average highest quantity were sold to Minor Forest Produce Society by large farmer i. e. 62.60 per cent followed by village merchant and direct to consumer with 26.55 and 10.85 per cent respectively. Among the edible NTFPs Chironjee is sold 100.00 per cent followed by Honeyand Tamarind with 75.76 and 66.08 per cent respectively to Minor Forest Produce Society. Mushroom is sold cent percent in market to the consumer directly.

Table 4.13: Disposal pattern of major NTFPs by medium farmers

S. No.	Name of NTFPs	Quantity of NTFPs traded (Kg.)	Disposal pattern of NTFPs (%)		
			Consumers	Village Merchant	Minor Forest Produce Society
1.	Mahua Flower	199.65 (100.00)	24.31 (12.18)	175.34 (87.82)	00.00 (00.00)
2.	Mahua Seed (Stone)	60.67 (100.00)	7.55 (12.44)	23.75 (39.15)	29.37 (48.41)
3.	Sal Seed	297.86 (100.00)	00.00 (00.00)	00.00 (00.00)	297.86 (100.00)
4.	Tamarind	143.07 (100.00)	25.98 (18.16)	68.21 (47.67)	48.88 (34.17)
5.	Tendu Leaves	51.43 (100.00)	00.00 (00.00)	00.00 (00.00)	51.43 (100.00)
6.	Mushroom (Wild & Edible)	7.00 (100.00)	7.00 (100.00)	00.00 (00.00)	00.00 (00.00)
7.	Chironjee	6.71 (100.00)	4.21 (62.74)	00.00 (00.00)	2.50 (37.26)
8.	Harra	32.86 (100.00)	00.00 (00.00)	12.42 (37.80)	20.44 (62.20)
9.	Baheda	27.14 (100.00)	00.00 (00.00)	12.86 (53.86)	14.28 (46.14)
10.	Honey	4.94 (100.00)	1.33 (26.92)	00.00 (00.00)	3.61 (73.08)
11.	Karanj Seed	35.00 (100.00)	00.00 (00.00)	35.00 (100.00)	00.00 (00.00)
12.	Kalmegh	0.31 (100.00)	00.00 (00.00)	00.00 (00.00)	0.31 (100.00)
	Total	**866.64 (100.00)**	**70.38 (8.12)**	**327.58 (37.80)**	**468.68 (54.08)**

Note: Figures in parenthesis indicates percentage to total

Table 4.14: Disposal pattern of major NTFPs by large farmers

S. No.	Name of NTFPs	Quantity of NTFPs traded (Kg.)	Disposal pattern of NTFPs (%)		
			Consumers	Village Merchant	Minor Forest Produce Society
1.	Mahua Flower	134.50 (100.00)	71.41 (53.09)	63.09 (46.91)	00.00 (00.00)
2.	Mahua Seed (Stone)	13.50 (100.00)	00.00 (00.00)	5.75 (42.59)	7.75 (57.41)
3.	Sal Seed	211.00 (100.00)	00.00 (00.00)	00.00 (00.00)	211.00 (100.00)
4.	Tamarind	187.00 (100.00)	00.00 (00.00)	63.43 (33.92)	123.57 (66.08)
5.	Tendu Leaves	30.00 (100.00)	00.00 (00.00)	00.00 (00.00)	30.00 (100.00)
6.	Mushroom (Wild & Edible)	3.30 (100.00)	3.30 (100.00)	00.00 (00.00)	00.00 (00.00)
7.	Chironjee	1.50 (100.00)	00.00 (00.00)	00.00 (00.00)	1.50 (100.00)
8.	Harra	54.00 (100.00)	00.00 (00.00)	13.52 (25.04)	40.48 (74.96)
9.	Baheda	27.00 (100.00)	00.00 (00.00)	8.44 (31.26)	18.56 (68.74)
10.	Honey	3.30 (100.00)	0.80 (24.24)	00.00 (00.00)	2.50 (75.76)
11.	Karanj Seed	30.50 (100.00)	00.00 (00.00)	30.50 (100.00)	00.00 (00.00)
12.	Kalmegh	0.18 (100.00)	00.00 (00.00)	00.00 (00.00)	0.18 (100.00)
	Total	**695.78 (100.00)**	**75.51 (10.85)**	**184.73 (26.55)**	**435.54 (62.60)**

Note: Figures in parenthesis indicates percentage to total

It is clear from the table that the disposal of NTFPs shows similar pattern amongst all size of farms.

4.5.3 Marketing channels of NTFPs:

The study indicates that there were two to three marketing channels for different NTFPs viz. Mahua flower and Honey have two marketing channels and tamarind and having three channels. Channel – I : Collector – Consumer; Channel – II : Collector – Village level retailer (Kochia) - Wholesaler – Consumer and Channel – III : Collector – CGMFPFED (through commission agent) – Consumer. In case of Channel – II the price received by the wholesaler is considered as ultimate consumer price and in case of Channel – III the price at which CGMFPFED sells the NTFPs is the ultimate consumer price.

4.5.4 Marketing cost of NTFPs

Table 4.15 clearly indicates that the marketing charges of Tamarind involved in Channel – I paid by the collector is Rs. 195.00 and in Channel – II the marketing charges paid by the Collector, village retailer and Wholesaler are Rs. 194.50, 73.93 and 92.90 respectively. In Channel – III the marketing charges paid by the collector was highest Rs. 244.50 as compared to other channels as it requires good amount of processing. The marketing charges paid by CGMFPFED were Rs. 546.40.

In table 4.16 it is clearly indicates that the marketing charges paid by the collectors in the marketing of Mahua is Rs. 54.10 per quintal in Channel – I, and the marketing charges paid by the collectors, village level retailers and wholesalers was observed Rs. 65.14, 72.34 and 83.94 per quintal respectively.

Table 4.17 clearly indicates that the marketing charges paid by the collector paid in the marketing of Honey came to Rs. 363.70 per quintal in channel – Iand the marketing charges paid by the collectors and CGMFPFED including the payment of the commission agent came to Rs. 350.83 and 5448.34 respectively in channel – II.

Table 4.18 clearly indicates that the marketing charges paid by the collector paid in the marketing of Chironjee came to Rs. 669.50 per quintal inchannel – I, the marketing charges paid by the collectors, village level retailers and wholesalers was observed Rs. 669.50, 341.05and 417.64 per quintal respectively in channel – II and the marketing charges paid by the collectors and CGMFPFED including the payment of the commission agent came to Rs. 669.50 and 1876.60 respectively in channel – III.

4.5.5 Price spread analysis of NTFPs:

The price spread analysis of Tamarind was presented in the table 4.15. It can be seen from the table that the net price received by the collectors was highest being 89.57 per cent in channel – I followed by 50.63 and 34.34 per cent in channel – II and channel – III respectively. The net margin for village retailer and wholesaler was at 14.48 and 22.28 per cent respectively along with 12.61 per cent marketing charges in channel – II. The net margin for CGMFPFED was observed 49.84 percent after the payment of commission agent along with 15.82 per cent marketing charges in channel – III.

The price spread analysis of Mahua was presented in the table 4.16. It can be seen from the table that the net price received by the collectors was highest being 96.91 per cent in channel – I followed by 61.85 per cent in channel – II. The net margin for village retailer and wholesaler was at 12.43 and 18.00 per cent respectively along with 7.72 per cent marketing charges in channel – II.

Table 4.15: Price spread of Tamarind under different Marketing Channels

(Rs. / quintal)

S. No.	Particulars	Charges (Rs. / qt.)	Channel – I	Channel – II	Channel – III
A.	**Collectors**				
	Price received by collector		1868.79	1635.51	1961.27
	Processing cost		175.00	175.00	225.00
	Transportation charges		16.00	16.00	16.00
	Loading / Unloading charges		4.00	3.50	3.50
	Sub-total (marketing cost)		**195.00**	**194.50**	**244.50**
	Net price received by collector		1673.79	1441.01	1716.77
			(89.57)	(50.63)	(34.34)
B.	**Village Level Merchant (Kochia)**				
	Transportation charges	20.00		20.00	
	Loading / Unloading charges	3.50		3.50	
	Miscellaneous charges	2% of the total value		42.42	
	Weighing and Packing charges	8.01		8.01	
	Sub-total (marketing cost)			**73.93**	
	Price paid by village Merchant			1635.51	
	Price received by village Merchant			2121.13	
	Net margin of village Merchant			411.99	
				(14.48)	
C.	**Wholesaler**				
	Transportation charges	20.00		20.00	
	Loading / Unloading charges	4.00		4.00	
	Miscellaneous charges	2% of the total value		56.92	
	Weighing and Packing charges	10.00		10.00	
	Sub-total (marketing cost)			**90.92**	
	Price paid by Wholesaler			2121.13	
	Price received by Wholesaler			2846.21	
	Net margin of Wholesaler			634.16	
				(22.28)	
D.	**CGMFPMFED**				
	Payment of Commission agent				197.15
	Transportation charges				20.00
	Loading / Unloading charges				4.25
	Packing and wrapping Charges				25.00
	Processing charges				300
	Sub-total (marketing cost)				**546.40**
	Price paid by CGMFPMFED				1961.27
	Price received by CGMFPMFED				5000
	Net margin of CGMFPMFED				2492.33
					(49.84)
	Total marketing cost		**195.00**	**359.35**	**790.90**
			(10.43)	(12.61)	(15.82)
	Ultimate Consumer Price		1868.79	2846.21	5000.00
			(100.00)	(100.00)	(100.00)

Table 4.16: Price spread of Mahua Flower under different Marketing Channels

(Rs. / quintal)

S. No.	Particulars	Charges (Rs. / qt.)	Channel – I	Channel – II
A.	**Collectors**			
	Price received by collector		1749.14	1838.40
	Processing cost		34.96	41.04
	Transportation charges		15.67	20.56
	Loading / Unloading charges		3.77	3.54
	Sub-total (marketing cost)		**54.10**	**65.14**
	Net price received by collector		1695.03	1773.26
			(96.91)	(61.85)
B.	**Village Level Merchant (Kochia)**			
	Transportation charges	16.00		16.00
	Loading / Unloading charges	3.50		3.50
	Physical losses	1% of the total value		22.67
	Weighing and Packing charges	7.50		7.50
	Miscellaneous Charges	1% of the total value		22.67
	Sub-total (marketing cost)			**72.34**
	Price paid by village Merchant			1838.40
	Price received by village Merchant			2267.13
	Net margin of village Merchant			356.39
				(12.43)
C.	**Wholesaler**			
	Transportation charges	16.00		16.00
	Loading / Unloading charges	4.00		4.00
	Physical losses	2% of the total value		26.97
	Weighing and Packing charges	10.00		10.00
	Miscellaneous Charges	2% of the total value		26.97
	Sub-total (marketing cost)			**83.94**
	Price paid by Wholesaler			2267.13
	Price received by Wholesaler			2867.21
	Net margin of Wholesaler			516.14
				(18.00)
	Total marketing cost		**54.10**	**221.42**
			(3.19)	(7.72)
	Ultimate Consumer Price		1695.03	2867.21
			(100.00)	(100.00)

It can be seen from the table 4.17 that the net price received by the collectors was highest being 98.83 per cent in channel – I followed by 66.27 per cent in channel – II. The net margin for CGMFPFED was observed 22.14 percent after the payment of commission agent along with 11.59 per cent marketing charges in channel – III.

Table 4.17: Price spread of Honey under different Marketing Channels

(Rs. / quintal)

S. No.	Particulars	Channel – I	Channel – III
A.	**Collectors**		
	Price received by collector	31153.37	33483.41
	Processing cost	347.70	334.83
	Transportation charges	16.00	16.00
	Sub-total (marketing cost)	**363.70**	**350.83**
	Net price received by collector	30789.67	33132.58
		(98.83)	(66.27)
B.	**CGMFPMFED**		
	Payment of Commission agent		3348.34
	Transportation charges		20.00
	Packing and wrapping Charges		1500
	Processing charges		600
	Sub-total (marketing cost)		**5448.34**
	Price paid by CGMFPMFED		33483.41
	Price received by CGMFPMFED		50000.00
	Net margin of CGMFPMFED		11068.25
			(22.14)
	Total marketing cost	**363.70**	**5799.17**
		(1.17)	(11.59)
	Ultimate Consumer Price	31153.37	50000.00
		(100.00)	(100.00)

The price spread analysis of Chironjee was presented in the table 4.18. It can be seen from the table that the net price received by the collectors was highest being 95.05 per cent in channel – I followed by 66.84 and 53.10 per cent in channel – II and channel – III respectively. The net margin for village retailer and wholesaler was at 8.27 and 17.42 per cent respectively along with 7.47 per cent marketing charges in channel – II. The net margin for CGMFPFED was observed 36.72 percent after the payment of commission agent along with 10.18 per cent marketing charges in channel – III.

Table 4.18: Price spread of Chironjee under different Marketing Channels

(Rs. / quintal)

S. No.	Particulars	Charges (Rs. / qt.)	Channel – I	Channel – II	Channel – III
A.	**Collectors**				
	Price received by collector		13523.26	13440.43	13942.67
	Processing cost		650.00	650.00	650.00
	Transportation charges		16.00	16.00	16.00
	Loading / Unloading charges		3.50	3.50	3.50
	Sub-total (marketing cost)		**669.50**	**669.50**	**669.50**
	Net price received by collector		12853.76 (95.05)	12770.93 (66.84)	13273.17 (53.10)
B.	**Village Level Merchant (Kochia)**				
	Transportation charges	20.00		20.00	
	Loading / Unloading charges	3.50		3.50	
	Miscellaneous charges	2% of the total value		307.21	
	Weighing and Packing charges	8.01		10.34	
	Sub-total (marketing cost)			**341.05**	
	Price paid by village Merchant			13440.43	
	Price received by village Merchant			15360.41	
	Net margin of village Merchant			1578.93 (8.27)	
C.	**Wholesaler**				
	Transportation charges	20.00		20.00	
	Loading / Unloading charges	4.00		3.50	
	Miscellaneous charges	2% of the total value		382.14	
	Weighing and Packing charges	10.00		12.00	
	Sub-total (marketing cost)			**417.64**	
	Price paid by Wholesaler			15360.41	
	Price received by Wholesaler			19107.05	
	Net margin of Wholesaler			3329.00 (17.42)	
D.	**CGMFPMFED**				
	Payment of Commission agent				1801.35
	Transportation charges				20.00
	Loading / Unloading charges				4.25
	Packing and wrapping Charges				35.00
	Processing charges				16.00
	Sub-total (marketing cost)				**1876.60**
	Price paid by CGMFPMFED				13942.67
	Price received by CGMFPMFED				25000.00
	Net margin of CGMFPMFED				9180.73 (36.72)
	Total marketing cost		**669.50** (4.95)	**1428.19** (7.47)	**2546.10** (10.18)
	Ultimate Consumer Price		13523.26 (100.00)	19107.05 (100.00)	25000.00 (100.00)

4.6 Processing and value addition of Major NTFPs at primary collectors level

Table 4.19 shows that on an average the selling price per Kg. of major raw NTFPs i.e. Mahua flower, Sal seed, Tamarind and Chironjee was found Rs. 13.36, Rs. 5.36, Rs. 14.45 and Rs. 96.17 respectively; the price after value addition and processing was found Rs. 18.54, Rs. 7.14, Rs. 23.41 and Rs. 138.17 respectively. The processing cost incurred was found Rs. 1.20, Rs. 1.00, Rs. 2.50 and Rs. 10.50 respectively. Per Kg. cost of processing was found highest for Kalmegh with Rs. 20.00 and lowest for Harra and Baheda with Rs. 0.75 each.

4.6.1 Category wise processing and value addition of major NTFPs

The table 4.20 shows that the average selling price per Kg. of major raw NTFPs i.e. Mahua flower, Sal seed, Tamarind and Chironjee was found Rs. 13.42, Rs. 5.25, Rs. 14.82 and Rs. 100.38 for marginal farmers and after processing the selling price goes up to Rs. 19.10, Rs. 7.15, Rs. 24.58 and 145.00 respectively; with profit of Rs. 4.48, Rs. 0.90, Rs. 7.26 and Rs. 34.12 respectively.

For small farmers the average selling price per Kg. of raw NTFPs was found Rs. 12.67, Rs. 5.20, Rs. 14.64 and Rs. 95.80 for Mahua flower, Sal seed, Tamarind and Chironjee respectively which provided them profit of Rs. 3.13, Rs. 1.22, Rs. 6.60 and 31.20 respectively after processing.

For medium farmers the average selling price per Kg. of raw NTFPs was found Rs. 13.27, Rs. 7.22, Rs. 13.54 and Rs. 88.71 for Mahua flower, Sal seed, Tamarind and Chironjee respectively which provided them profit of Rs. 3.39, Rs. 0.85, Rs. 5.59 and 32.29 respectively after processing.

For large farmers the average selling price per Kg. of raw NTFPs was found Rs. 14.94, Rs. 5.50, Rs. 14.82 and Rs. 102.00 for Mahua flower, Sal seed, Tamarind and Chironjee respectively which provided them profit of Rs. 6.14, Rs. 0.72, Rs. 6.08 and 27.50 respectively after processing.

Table 4.19: Average cost of processing and value addition of major marketable NTFPs by sampled households

S. No.	Name of NTFP	Quantity Collected (Kg.)	Quantity Processed (Kg.)	Methods of Processing / Value Addition	Price of Raw NTFP (Rs. /Kg.)	Processing Cost (Rs. /Kg.)	Price of Value added NTFPs (Rs. /Kg.)	Profit
1.	Mahua Flower	211.17 (26.11)	211.17 (100.00)	Sun drying + selling out of season	13.36	1.20	18.54	3.98 (29.79)
2.	Mahua Seed	43.25 (5.35)	43.25 (100.00)	Sun drying + De-shelling + Sun drying	7.24	0.80	9.38	1.34 (18.51)
3.	Sal Seed	272.25 (33.66)	272.25 (100.00)	Sun drying + Burning + De-shelling	5.25	1.00	7.14	0.89 (16.95)
4.	Tamarind	184.33 (22.79)	114.08 (61.89)	De-shelling + De-seeding + Cleaning	14.45	2.50	23.41	6.46 (44.71)
5.	Chironjee	8.18 (1.01)	8.13 (99.39)	Sun drying + De-shelling	96.17	10.50	138.17	31.50 (32.75)
6.	Harra	43.75 (5.40)	43.75 (100.00)	Sun drying	7.00	0.75	9.41	1.66 (23.71)
7.	Baheda	21.17 (2.62)	21.17 (100.00)	Sun drying	7.20	0.75	10.30	2.35 (32.64)
8.	Karanj Seed	24.58 (3.043	24.58 (100.00)	De-shelling + Sun drying	6.87	1.20	10.55	2.48 (36.09)
9.	Kalmegh	0.23 (0.03)	0.23 (100.00)	Drying in Shade + Powdering	125.36	20.00	227.35	81.99 (65.40)
	Total	**808.91 (100.00)**	**738.61 (91.31)**					

Note: Figures in parenthesis indicates percentage of additional profit after primary processing

Table 4.20: Cost of processing and value addition of major marketable NTFPs by marginal farmer

S. No.	Name of NTFP	Quantity Collected (Kg.)	Quantity Processed (Kg.)	Methods of Processing / Value Addition	Price of Raw NTFP (Rs. /Kg.)	Processing Cost (Rs. /Kg.)	Price of Value added NTFPs (Rs. /Kg.)	Profit
1.	Mahua Flower	225.00 (26.84)	225.00 (100.00)	Sun drying + selling out of season	13.42	1.20	19.10	4.48 (33.38)
2.	Mahua Seed	40.77 (4.86)	40.77 (100.00)	Sun drying + De-shelling + Sun drying	6.85	0.80	9.07	1.42 (20.73)
3.	Sal Seed	285.77 (34.08)	285.77 (100.00)	Sun drying + Burning + De-shelling	5.25	1.00	7.15	0.90 (17.14)
4.	Tamarind	191.92 (22.89)	114.61 (90.14)	De-shelling + De-seeding + Cleaning	14.82	2.50	24.58	7.26 (48.98)
5.	Chironjee	16.00 (1.91)	12.54 (78.38)	Sun drying + De-shelling	100.38	10.50	145.00	34.12 (33.99)
6.	Harra	37.31 (4.45)	37.31 (100.00)	Sun drying	6.92	0.75	9.50	1.83 (26.44)
7.	Baheda	25.77 (3.07)	25.77 (100.00)	Sun drying	7.50	0.75	10.38	2.13 (28.40)
8.	Karanj Seed	15.77 (1.88)	15.77 (100.00)	De-shelling + Sun drying	5.80	1.20	10.00	3.00 (51.72)
9.	Kalmegh	0.18 (0.02)	0.18 (100.00)	Drying in Shade + Powdering	135.00	20.00	250.00	95.00 (70.37)
	Total	**838.49 (100.00)**	**757.72 (90.37)**					

Note: Figures in parenthesis indicates percentage of additional profit after primary processing

Table 4.21: Cost of processing and value addition of major marketable NTFPs by small farmer

S. No.	Name of NTFP	Quantity Collected (Kg.)	Quantity Processed (Kg.)	Methods of Processing / Value Addition	Price of Raw NTFP (Rs. /Kg.)	Processing Cost (Rs. /Kg.)	Price of Value added NTFPs (Rs. /Kg.)	Profit
1.	Mahua Flower	225.22 (26.86)	225.22 (100.00)	Sun drying + selling out of season	12.67	1.20	17.00	3.13 (24.70)
2.	Mahua Seed	45.43 (5.42)	45.43 (100.00)	Sun drying + De-shelling + Sun drying	7.05	0.80	9.07	1.22 (17.30)
3.	Sal Seed	275.65 (32.87)	275.65 (100.00)	Sun drying + Burning + De-shelling	5.20	1.00	7.18	0.98 (18.85)
4.	Tamarind	190.22 (22.69)	108.91 (57.25)	De-shelling + De-seeding + Cleaning	14.64	2.50	23.74	6.60 (45.08)
5.	Chironjee	6.13 (0.73)	5.13 (83.69)	Sun drying + De-shelling	95.80	10.50	137.50	31.20 (32.57)
6.	Harra	49.56 (5.91)	49.56 (100.00)	Sun drying	6.50	0.75	8.83	1.58 (24.31)
7.	Baheda	25.43 (3.03)	25.43 (100.00)	Sun drying	6.55	0.75	9.48	2.18 (33.28)
8.	Karanj Seed	20.65 (2.46)	20.65 (100.00)	De-shelling + Sun drying	5.47	1.20	9.54	2.87 (52.47)
9.	Kalmegh	0.23 (0.03)	0.23 (100.00)	Drying in Shade + Powdering	138.26	20.00	260.00	101.74 (73.58)
	Total	**838.52 (100.00)**	756.21 **(89.15)**					

Note: Figures in parenthesis indicates percentage of additional profit after primary processing

Table 4.22: Cost of processing and value addition of major marketable NTFPs by medium farmer

S. No.	Name of NTFP	Quantity Collected (Kg.)	Quantity Processed (Kg.)	Methods of Processing / Value Addition	Price of Raw NTFP (Rs. /Kg.)	Processing Cost (Rs. /Kg.)	Price of Value added NTFPs (Rs. /Kg.)	Profit
1.	Mahua Flower	223.93 (26.51)	223.93 (100.00)	Sun drying + selling out of season	13.27	1.20	17.86	3.39 (25.54)
2.	Mahua Seed	63.21 (7.48)	63.21 (100.00)	Sun drying + De-shelling + Sun drying	7.22	0.80	9.46	1.44 (19.94)
3.	Sal Seed	297.86 (35.26)	297.86 (100.00)	Sun drying + Burning + De-shelling	5.15	1.00	7.00	0.85 (16.50)
4.	Tamarind	155.71 (18.44)	105.00 (67.43)	De-shelling + De-seeding + Cleaning	13.54	2.50	21.63	5.59 (41.28)
5.	Chironjee	8.71 (1.03)	6.71 (77.04)	Sun drying + De-shelling	88.71	10.50	131.50	32.29 (36.40)
6.	Harra	32.86 (3.89)	32.86 (100.00)	Sun drying	7.14	0.75	9.85	1.96 (27.45)
7.	Baheda	27.14 (3.21)	27.14 (100.00)	Sun drying	7.56	0.75	11.21	2.90 (38.36)
8.	Karanj Seed	35.00 (4.14)	35.00 (100.00)	De-shelling + Sun drying	8.50	1.20	11.90	2.20 (25.88)
9.	Kalmegh	0.31 (0.04)	0.31 (100.00)	Drying in Shade + Powdering	109.78	20.00	186.43	56.65 (51.60)
	Total	**844.73 (100.00)**	**792.02 (93.76)**					

Note: Figures in parenthesis indicates percentage of additional profit after primary processing

Table 4.23: Cost of processing and value addition of major marketable NTFPs by large farmer

S. No.	Name of NTFP	Quantity Collected (Kg.)	Quantity Processed (Kg.)	Methods of Processing / Value Addition	Price of Raw NTFP (Rs. /Kg.)	Processing Cost (Rs. /Kg.)	Price of Value added NTFPs (Rs. /Kg.)	Profit
1.	Mahua Flower	143.00 (19.78)	143.00 (100.00)	Sun drying + selling out of season	14.94	1.20	22.28	6.14 (41.10)
2.	Mahua Seed	13.50 (1.87)	13.50 (100.00)	Sun drying + De-shelling + Sun drying	8.25	0.80	10.37	1.32 (16.00)
3.	Sal Seed	211.00 (29.19)	211.00 (100.00)	Sun drying + Burning + De-shelling	5.50	1.00	7.22	0.72 (13.09)
4.	Tamarind	201.00 (27.81)	138.00 (68.66)	De-shelling + De-seeding + Cleaning	14.82	2.50	23.40	6.08 (41.02)
5.	Chironjee	2.00 (0.28)	2.00 (100.00)	Sun drying + De-shelling	102.00	10.50	140.00	27.50 (26.96)
6.	Harra	54.00 (7.47)	54.00 (100.00)	Sun drying	8.00	0.75	10.00	1.25 (15.62)
7.	Baheda	27.00 (3.74)	27.00 (100.00)	Sun drying	7.80	0.75	10.80	2.25 (28.85)
8.	Karanj Seed	30.50 (4.22)	30.50 (100.00)	De-shelling + Sun drying	9.20	1.20	11.70	1.30 (14.13)
9.	Kalmegh	0.18 (0.02)	0.18 (100.00)	Drying in Shade + Powdering	105.00	20.00	195.00	70.00 (66.67)
	Total	**682.18 (100.00)**	**619.18 (90.76)**					

Note: Figures in parenthesis indicates percentage of additional profit after primary processing

4.7 Constraints in collection, primary processing and marketing of NTFPs

Constraints occurred in the process of collection, processing and marketing of NTFPs are presented in table 4.24 below. The table indicates that 'deforestation' is the main constraints faced by 21.67% of the sampled NTFPs collectors followed by forest fire, time required, problem of storage and less quantity available are amongst other constraints at 15.00, 13.34, 10.00 and 10.00 per cent respectively.

Table 4.24: Constraints faced by the respondents (collectors of NTFPs) in collection, processing and marketing of NTFPs

(N = 60)

S. No.	Constraints	Frequency	Percentage
1.	Deforestation	13	21.67
2.	Forest fire	9	15.00
3.	Time consuming	8	13.34
4.	Less quantity available	6	10.00
5.	Storage problem	6	10.00
6.	No primary processing units	5	8.33
7.	Collection area far from home	5	8.33
8.	Improper pricing of raw produce	5	8.33
9.	Competition amongst collectors	3	5.00
	Total	**60**	**100.00**

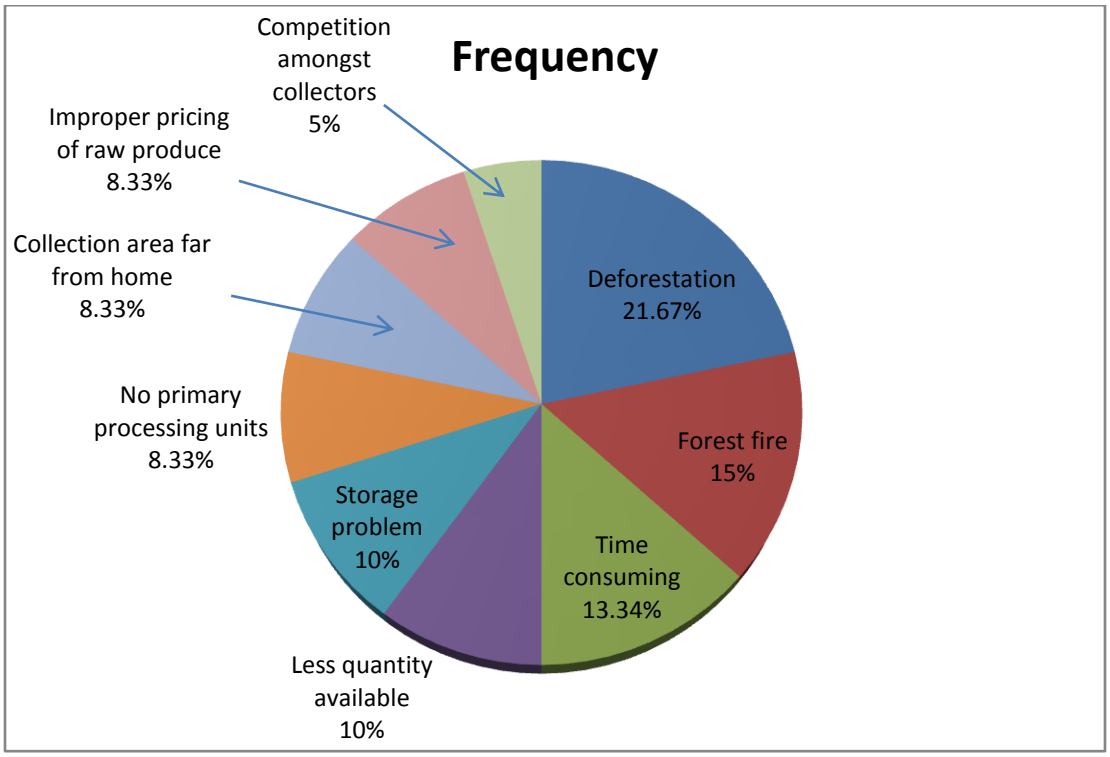


Fig. 4.14: Constraints faced by respondents in collection, processing and marketing of NTFPs

SUMMARY, CONCLUSIONS AND SUGGESTIONS FOR THE FUTURE RESEARCH WORK

CHAPTER – V

SUMMARY, CONCLUSION AND SUGGESTIONS FOR THE FUTURE RESEARCH WORK

5.1 Summary and Conclusions

The importance of Non Timber Forest Products (NTFPs) contributing to rural livelihoods and alleviating rural poverty is well known in Chhattisgarh. Non-timber forest products are emerging as the major source of income for the rural poor. Earlier NTFPs were only collected but now a day's NTFPs like Lac, Kalmegh are cultivated as well in Chhattisgarh. Chhattisgarh accounts 46.39 per cent of the geographical area under forest and out of the total geographical area of 8755.79 km² Bastar district accounts about 6654.24 km² which is more than 75 per cent of total geographical area.

The findings of the present research and enquiry would be greater significant to the policy makers. Further, economists may develop new policies on the marketing of non-timber forest products (NTFPs) so that the profitability share (producers share in consumer rupee) should be increased. Further, the study was undertaken in the selected villages of Bastar district, where farmers are not cultivating the NTFPs but making profit out of it by collecting them and selling into the market either directly to the consumers or through the mediators at different levels. The state Government also plays a key role in enhancing their profit by procuring most of the NTFPs either through commission agents or through Primary Minor Forest Produce Society at village level.

The study further examines the collection, consumption, selling and primary processing of NTFPs in Bastar district of Chhattisgarh with following objectives:

- To find out the collection and marketing pattern of major Non–Timber Forest Products (NTFPs).
- To examine the marketing channels, costs, margins and price spread of major NTFPs.
- To work out the economics of NTFPs processing at primary level.
- To find out the major constraints in collection, processing and marketing of NTFPs and suggest some policy measures.

The present study was conducted in Bastar district of Chhattisgarh state. Sixty farmers (NTFPs collectors) were selected randomly from six villages of three development block of Bastar district. The villages include Kolawal and Chhindgaon from Bakawand block, Pushpal and Bamhni from Jagdalpur block and Kotwarpara (Hamlet village of Tirathgarh) and Koleng from Darbha block. Primary data was collected for the year 2011-12 with the help of well prepared and tested interview schedule. The secondary data regarding the collection and procurement of major NTFPs was collected from Bastar district. State, data was collected from forest department and Chhattisgarh Minor Forest Produce Marketing Federation (CGMFPFED) from Jagdalpur and Raipur respectively.

5.1.1 The present study yielded following major findings:

1. The average cropping intensity observed in the study area was 122.53 per cent and average literacy 63.08 per cent amongst the selected households in the study area.
2. On an average 886.07 Kg. of NTFPs were collected and out of those only 4.18 per cent was consumed and rest was sold in the market. Processing of 55.57 per cent out of the total collection was done.
3. On an average largest collected NTFP was Sal seed 30.73 per cent of collection followed by Mahua flower and Tamarind with 23.83 and 20.80 per cent respectively.

The lowest share of collection was by Kalmegh with only 0.03 per cent out of total collection.

4. Medium category of farm size collected highest quantity of sal seed which is 297.89 Kg. followed by marginal, small and large farm size with 287.77 Kg., 275.65 Kg. and 211.00 Kg. respectively.
5. On an average cent per cent quantity of Sal seed, Tendu leaves, Harra, Baheda, Karanj Seed and Kalmegh were sold in the market.
6. On an average Mushroom (Wild & Edible) was consumed highest with 40.44 per cent followed by honey and Chironjee at 22.94 and 19.56 per cent respectively.
7. Large category of farm size were largest consumer of Mushroom (Wild & Edible) with 43.10 per cent of the collection followed by marginal, small and medium farm size with 40.96, 40.53 and 38.76 per cent respectively.
8. On an average the processing of Chironjee at primary level was highest observed at 99.39 per cent out of total collection followed by Tamarind at 61.89 per cent. Other NTFPs were only sun dried and directly sold in the market.
9. On an average the total income earned through selling of NTFPs was Rs. 20258.59 annually. The average annual income earned through NTFPs by all groups of farm size viz. marginal, small, medium and large were at Rs. 23566.89, Rs. 21423.32, Rs. 19273.42 and Rs. 14587.50 respectively.
10. On an average the highest income was generated through selling of Tendu leaves with 32.71 per cent out of total income through NTFPs followed by Mahua flower, Tamarind, Sal seed and Honey with 16.62, 16.61, 9.55 and 8.30 per cent respectively.

11. Marginal farmers generate highest income through the selling of Tendu leaves with Rs. 8926.92 followed by small medium and large farm sizes at Rs. 7365.00, Rs. 5657.14 and Rs. 3300.00 respectively.
12. Highest income was generated through Tendu leaves with 37.88 per cent for marginal farm, 34.38 per cent for small farm and 29.35 per cent for medium farm but in case of large farm size Tamarind contributes highest income from NTFPs with 26.74 per cent.
13. On an average the cost of cultivation per hectare of paddy was calculated at Rs. 9913.82. The cost of cultivation showed rising trend with the rise of farm size viz. marginal, small, medium and large with Rs. 9013.83, Rs. 9650.95, Rs. 10291.48 and Rs. 11259.96 respectively.
14. The average days consumed in the collection of NTFPs are 134.33 per year per household dominated by female collectors with 64.27 per cent followed by male and children with 22.76 and 12.97 per cent contribution.
15. The average quantity processed of NTFPs is 43.19 per day dominated by female collectors with 80.85 per cent followed by male with 19.15 and children are not included in processing.
16. The average quantity marketed of NTFPs is 53.60 per day with higher contribution by male collectors with 72.44 per cent followed by female with 27.56 and children are not included in marketing.
17. Out of the total NTFPs traded, 56.52 per cent were traded to CGMFPFED through commission agent followed by village merchant at 32.55 per cent and rest 10.93 per cent were directly sold to consumer.

18. There were three marketing channels for the marketing of major NTFPs which are as follows:

    Channel – I: Collector – Consumer.

    Channel – II: Collector – Village level retailer (Kochia) - Wholesaler – Consumer.

    Channel – III: Collector – CGMFPFED (through commission agent) – Consumer.

19. Marketing charges paid by the collectors in the marketing of Tamarind, Mahua flower, Honey and Chironjee were came to Rs. 195.00, Rs. 54.10, Rs. 363.70 and Rs. 669.50 in channel – I .

20. The price spread analysis of Tamarind, Mahua flower, Honey and Chironjee was observed that net price received by the collectors was highest being 89.57, 96.91, 98.83 and 95.05 per cent respectively in channel – I.

21. In channel – II the net margin for collector was observed at 50.63, 61.85 and 66.84 per cent for Tamarind, Mahua flower and Chironjee respectively. The net margin for village merchant was found at 14.48, 12.43 and 8.27 per cent for Tamarind, Mahua flower and Chironjee respectively. The net margin for wholesaler was found at 22.28, 18.00 and 17.42 per cent for Tamarind, Mahua flower and Chironjee respectively.

22. In channel – III the net margin for collector was observed at 34.34, 66.27 and 53.10 per cent for Tamarind, Honey and Chironjee respectively. The net margin for CGMFPFED was observed at 49.84, 22.14 and 36.72 per cent for Tamarind, Honey and Chironjee respectively.

23. The marketing cost was observed highest in channel – III for all the major NTFPs traded.

24. Deforestation, forest fire, time consuming, storage problem, improper pricing and unavailability of NTFPs were the major constraints faced by the collectors.

5.2 Suggestions for the future research work

1. To improve the socio-economic conditions of the rural poor an alternative source of income is needed to uplift the standard of living.
2. There should be higher procurement price for all the Non-Timber Forest Products (NTFPs).
3. Afforestation should be promoted through distribution of plants to the farmers to avoid deforestation.
4. There should be proper storage facilities in Panchayat Bhavan at village level to save the collectors from distress selling of NTFPs.
5. Formulation of state level marketing board should to regulate and promote the purchase and sale of products within the state as well as outside the state at remunerative price.
6. Like the state Government of Chhattisgarh the Government of India should formulate suitable policies for the collectors regarding the collection, processing and marketing of NTFPs.
7. There should be more number of processing units for economically valuable NTFPs like Sal seed, Tamarind, Chironjee etc.
8. There should be proper and regular training programs for the collectors of NTFPs regarding the processing of NTFPs.
9. Significant involvement of the primary collectors in the marketing process fetches more income.

10. The market for NTFPs including Medicinal and Aromatic Plants (MAPs) should be highly organized and open.
11. The profitability index shows that there is more profit when the collector trades his produce to the CGMFPFED through commission agent instead of selling it to the open market.
12. The Forest Department of Chhattisgarh State should involve the rural people more, in the mission of saving the forest as in-situ conservation.

ABSTRACT

AN ECONOMIC ANALYSIS OF COLLECTION, PRIMARY PROCESSING AND MARKETING OF NON–TIMBER FOREST PRODUCTS IN BASTAR DISTRICT OF CHHATTISGARH

By

GOPAL KRISHNA ACHARYA

ABSTRACT

Non-Timber Forest Products (NTFPs) plays an important role in the socio-economic development and improving both national and local economy of a country like India.

This study was undertaken to fulfill the following objectives:

1. To find out the collection and marketing pattern of major Non–Timber Forest Products (NTFPs).
2. To examine the marketing channels, costs, margins and price spread of major NTFPs.
3. To work out the economics of NTFPs processing at primary level.
4. To find out the major constraints in collection, processing and marketing of NTFPs and suggest some policies to improve the situation.

The present study was conducted in six villages namely from Bakawand Block Kolawal and Chhindgaon villages, from Jagdalpur Block Puspal and Bamhni villages and from Darbha Block Kotwarpara (Hamlet village of Tirathgarh) and Koleng villages were selected for the study in Bastar District of Chhattisgarh. Sixty respondents (NTFP collectors) were selected randomly. Primary data was collected from selected respondents through personal interview method with the help of pre-tested schedule. The secondary data was collected from the department of forest and Chhattisgarh Minor Forest Produce Marketing Federation (CGMFPFED), Government of Chhattisgarh. The primary data was collected for the year 2011-12.

The major findings of the present study revealed that the average cropping intensity was 122.53 per cent. On an average 886.07 Kg. NTFPs including edible and non-edible were collected out of those 55.57 per cent were primarily processed and only 4.18 per cent were consumed and rest 95.82 per cent were sold in the market by sampled households. On an average Rs. 20258.69 per household per annum were generated

and 9.55 per cent respectively the lowest contributor being Kalmegh with 0.68 per cent. On an average 132 man days were found in their collection per household per annum.

The average annual income was Rs. 71643.03 per household and the contribution from NTFPs was 18.15 per cent. There were three marketing channels found for the marketing of major NTFPs which were as follows: Channel – I: Collector – Consumer; Channel – II: Collector – Village level retailer (Kochia) - Wholesaler – Consumer and Channel – III: Collector – CGMFPFED (through commission agent) – Consumer. More than 54 per cent of the total NTFPs were traded to Minor Forest Produce Society followed by village merchant with 35.37 per cent and directly to consumer 10.62 per cent. Price spread analysis of Tamarind, Mahua flower, Honey and Chironjee was observed that the net price received by the collectors was highest being at 98.83 per cent of Honey in channel – I. in channel – II the net margin was observed 50.63 per cent, 61.85 per cent, 66.27 per cent and 66.84 per cent in for Tamarind, Mahua flower, Honey and Chironjee respectively. On an average per Kg. cost of processing was highest in case of Kalmegh with Rs. 20.00 and lowest for Harra and Baheda with Rs. 0.75 each. On an average the highest profit per Kg. was highest in case of Kalmegh at Rs. 81.99 followed by Chironjee, Tamarind and Mahua flower with Rs. 31.50, Rs. 6.46 and Rs. 3.98 respectively. Deforestation, forest fire, more time required for collection of NTFPs, problem of storage are the major constraints faced by sampled NTFPs collectors. Study suggested that NTFPs can be the alternative source of rural income and employment through effective, scientific and in- destructive harvesting of NTFPs followed by effective marketing and at the same time making people come forward to protect the forest. It will help in maintaining the plant population for extracting NTFPs for generations to come.

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APPENDICES

APPENDIX – I

Table: Procurement and sale of Non-Timber Forest Products in different states of India

S. No.	State	Procurement values (inLakhs)			Sale value(in Lakhs)		
		2008-09	2009-10	Total	2008-09	2009-10	Total
1.	Madhya Pradesh	21915.11 (58.99)	28953.00 (52.52)	50868.11 (55.12)	20861.84 (46.40)	26799.57 (44.55)	47661.41 (45.34)
2.	**Chhattisgarh**	**12304.79 (33.13)**	**23949.18 (43.44)**	**36253.97 (39.29)**	**21424.76 (47.66)**	**30478.39 (50.66)**	**51903.15 (49.38)**
3.	Andhra Pradesh	1302.26 (3.51)	900.34 (1.63)	2202.60 (2.39)	1624.93 (3.61)	1284.99 (2.14)	2909.92 (2.77)
4.	Gujarat	907.03 (2.44)	798.01 (1.45)	1705.04 (1.85)	516.75 (1.14)	758.44 (1.25)	1275.19 (1.22)
5.	Karnataka	267.08 (0.72)	117.70 (0.22)	384.78 (0.42)	107.67 (0.27)	148.81 (0.25)	256.48 (0.24)
6.	Maharashtra	233.59 (0.63)	52.70 (0.09)	286.29 (0.31)	126.49 (0.28)	448.70 (0.75)	575.19 (0.55)
7.	West Bengal	130.84 (0.35)	206.42 (0.37)	337.26 (0.36)	192.01 (0.42)	186.31 (0.31)	378.32 (0.36)
8.	Rajasthan	52.47 (0.14)	114.79 (0.21)	167.26 (0.18)	67.25 (0.15)	29.63 (0.05)	96.88 (0.09)
9.	Orissa	36.77 (0.09)	40.24 (0.07)	77.01 (0.08)	30.46 (0.07)	24.58 (0.04)	55.04 (0.05)
	Grand Total	**37149.94 (100.00)**	**55132.38 (100.00)**	**92282.32 (100.00)**	**44952.16 (100.00)**	**60159.42 (100.00)**	**105111.58 (100.00)**

Source: TRIFED report, September 2010

APPENDIX-II

DEPARTMENT OF AGRICULTURAL ECONOMICS

INDIRA GANDHI KRISHI VISHWAVIDYALAYA, RAIPUR (C.G.)

"AN ECONOMIC ANALYSIS OF COLLECTION, PRIMARY PROCESSING AND MARKETING OF NON-TIMBER FOREST PRODUCTS IN BASTAR DISTRICT OF CHHATTISGARH"

Household Schedule

District: _____ Interview Date: _____

Block: _____ Village: _____

General information: (Farmer/ Collector's survey)

Name of respondent – …….. **Age –** ……..

Sex – (Male/Female)…….. **Caste – (GEN/OBC/ST/SC)** …….

Household size: Large/Small/Medium…….

Source of Irrigation:

S. No.	Irrigation Source	Area (ha)	Irrigation Charges (Rs.)	Remarks
1.	Tube Well			
2.	Tank			
3.	Canal			
4.	Well			
5.	Stop Dam			
6.	Others			
Total				

Family size and composition:

S. No.	Name	Sex (m/f)	Age (Years)	Relation with Head	Education	Occupation	Employment (Days)			Income (in Rs.)		
							Farm	Off farm	Non farm	Farm	Off farm	Non farm
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												

Land Holding:

S.No.	Ownership	Area (ha)	Agriculture		Source of irrigation	Soil Type	Land quality #
			Irrigated area (ha)	Unirrigated area (ha)			
1.	Owned						
	Cultivated						
	Homestead						
2.	Leased in						
3.	Leased out						
Total							

1 = Poor, 2 = Average, 3 = Good, 4 = Very Good

Crop details:

S. No.	Crops Cultivated	Area (in ha.)	Total Cost (Operation wise)	Yield (Quintal)	Gross Return	Net Income
1.						
2.						
3.						
4.						
5.						
Total						

NTFPs and their details:

S. No.	Name of NTFP	Season of Collection	Method of Harvesting	Quantity Collected	Distance from Home	Distance from Market	Marketing Cost (Rs.)
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12							
13.							
14.							
15.							
16.							
17.							
18.							

Details of NTFPs Collection:

S. No.	Particulars	Male	Female	Children	Total
1.	No. of active days involved in collection in a year.				
2.	No. of active wage earning days in a year.				
3.	No of active hours of works in a day				
4.	Quantity collected/person/day				
5.	Quantity processed/person/day				
6.	Quantity marketed/person/day				
7.	Income earned/person/day				
Total					

Consumption and Disposable Pattern of NTFPs:

S. No.	NTFPs Qty. Collected	Consumption of NTFPs	Quantity Sold (Rs./Kg.)											
1.			Q	P	Q	P	Q	P	Q	P	Q	P	Q	P
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														
11.														
12.														
13.														
14.														
15.														
16.														
17.														
18.														

Processing ofNTFPs at farm level:

S. No.	Name of NTFPs	Quantity Processed (in kg.)	Methods of Processing	Processing Cost (in Rs.)	Selling Price (in Rs.)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					

Different Marketing Channels for NTFPs:

1. Collector → Consumer
2. Collector → Wholesaler (Private Traders) → Consumer
3. Collector → Wholesaler → Retailer → Consumer
4. Collector → District SHGs → Sanjivani Mart → Consumer
5. Collector → Block SHGs → Sanjivani Mart → Consumer
6. Collector → Village SHGs → Sanjivani Mart → Consumer
7. Collector → Village SHGs →Block SHGs → District SHGs → Sanjivani Mart → Consumer

Constrains in Collection, Marketing and Processing of NTFPs:

Trader's Interview / Survey: **Date of Interview……..**

1. **Name of Trader –** …….
2. **Name of Market –** …….
3. **Any other occupation of Trader –** …….
4. **Method of fixing prices –** ……
5. **Total Quantity of Collected and Stored NTFPs**

S. No.	Months	Total Quantity of Purchase (Qt.)	Price Paid (Rs./Qt.)	Price Received (Rs./Qt.)	Total Quantity Stored (Qt.)	Cost Involved Storage (Rs./Qt.)
1.	January					
2.	February					
3.	March					
4.	April					
5.	May					
6.	June					
7.	July					
8.	August					
9.	September					
10.	October					
11.	November					
12.	December					
	Total					

6. **Processed and Value added items:**

S. No.	Name of NTFP	Unprocessed Price (Rs./Kg.)	Processed Price (Rs./Kg.)	Raw items Price (in Rs.)	Value added items Price (in Rs.)	Transport Cost (Rs./Kg.)	Other Costs
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							
16.							
17.							
18.							

Sanjivani Mart Schedule:

S. No.	Name of NTFPs Purchased	Quantity Purchased	Quantity Processed	Rate of Purchase	Cost of Processing	Commission	Others	Net Profit
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								

Purchase from Commission agent or Direct from NTFP Collector :

If purchase from commission agent then commission charges (Rs./Qt.)

Number of Labours (Workers) required /day

Cost incurred on Laboures (Daily /monthly)

a. Mandi fee Rs. _____
b. Weighing charges Rs. _____
c. Packing Charges Rs. _____
d. Loading-unloading Charges Rs. _____
e. Transportation Charges Rs._____
f. Storage Charges Rs. _____
g. Any other Charges Rs. _____

Other Expenditures / Costs

a) License fee (Rs. /year): _____
b) Maintenance expenses (Rs. / year): _____
c) Expenditure on stationaries (Rs. / year): _____
d) Rent on Shop (Rs. / month): _____
e) Capital investment _____
f) Interest on capital _____

Other miscelaneous expenses (Rs.) _____

Any losses incurred (Yes / No) _____

If yes then how much (Qt.) _____

To whom the produce is sold _____

Price received by the trader for the produce (Rs. / Qt.) _____

Who decides / fixes the price _____

How to fix or decide the price _____

APPENDIX-III

NAME OF SAMPLED FARMERS

S. No.	Name of Farmer	S. No.	Name of Farmer	S. No.	Name of Farmer	S. No.	Name of Farmer
	Marginal		**Small**		**Medium**		**Large**
1.	NarsinghBharti	1.	Gundhar	1.	Somaru Ram	1.	LaxminathBaghel
2.	Raju	2.	Sondhar	2.	Tomlal	2.	ParshuramYadav
3.	Lingu Ram	3.	DharnujayBharti	3.	LubhanYadav	3.	Chamku
4.	PannalalMaurya	4.	Jugarnath Das	4.	ChandarnahYadav	4.	Bhimsen
5.	Pokhand Singh	5.	Sukhdev	5.	Budhru Ram Baghel	5.	DharmuBaghel
6.	Paklu Ram	6.	Ramnath Das	6.	Kamlu	6.	Ramprasad
7.	Shreenath	7.	BalramKashyap	7.	DukaluYadav	7.	Dashrath
8.	MadanSethiya	8.	RoopsayBaghel	8.	Sadanand	8.	Jugdhar
9.	Madhusudan	9.	Narhari	9.	Sugreev	9.	Jairam Das
10.	Milku Ram	10.	Devdas	10.	Babulal	10.	Bholanath Nag
11.	Dhansingh	11.	Damodar	11.	Ghataru		
12.	SohanlalPoyam	12.	Mahadev	12.	Bhoglal		
13.	Kamlesh	13.	Son Singh	13.	GangadharBhuarya		
		14.	Dayaram	14.	Sampath		
		15.	SukhlalSethiya				
		16.	Sukru Ram				
		17.	Laxmidhar				
		18.	Somali Bai				
		19.	Mangalu Ram				
		20.	JanardanDhruv				
		21.	PadamnathBaghel				
		22.	Dayalu Ram				
		23.	Shivaprasad				

APPEXDIX-IV

Table: Economics of paddy crop under different size groups of farm

(Rs. / ha)

S. No.	Particulars	Farm Size				Average
		Marginal	Small	Medium	Large	
1.	Family Human Labour	2215.11 (21.38)	1814.30 (16.10)	1242.62 (10.22)	956.00 (7.02)	1624.70 (13.94)
2.	Hired Human Labour	1625.56 (15.70)	2286.91 (20.30)	2734.47 (22.51)	3435.57 (25.24)	2439.49 (20.93)
3.	Total Human Labour	3840.67 (37.08)	4101.21 (36.40)	3977.09 (32.73)	4391.57 (32.26)	4064.19 (34.87)
4.	Bullock Labour	1133.33 (10.94)	822.60 (7.30)	628.71 (5.17)	375.00 (2.76)	770.08 (6.61)
5.	Tractor Power	387.24 (3.74)	617.19 (5.48)	1163.50 (9.58)	1476.25 (10.84)	838.02 (7.19)
6.	Seed Cost	1187.57 (11.46)	1178.50 (10.46)	1257.37 (10.35)	1285.46 (9.44)	1216.69 (10.44)
7.	Manure and Fertilizer	1753.47 (16.93)	2159.54 (19.17)	2279.76 (18.76)	2693.19 (19.79)	2188.55 (18.78)
8.	Irrigation Charges	165.56 (1.60)	144.78 (1.29)	174.51 (1.44)	198.94 (1.46)	165.26 (1.42)
9.	Plant Protection Materials	334.56 (3.23)	595.78 (5.29)	751.51 (6.19)	1152.94 (8.47)	668.38 (5.74)
11.	Interest on Working Capital	594.16 (5.73)	649.32 (5.76)	690.69 (5.68)	781.20 (5.74)	655.50 (5.63)
10.	Land Revenue	12.00 (0.12)	12.00 (0.11)	12.00 (0.10)	12.00 (0.09)	12.00 (0.10)
12.	Rental value of land	950.00 (9.17)	985.00 (8.74)	1215.00 (10.00)	1245.00 (9.15)	1074.42 (9.22)
	Total Input Cost	**10358.56 (100.00)**	**11265.92 (100.00)**	**12150.14 (100.00)**	**13611.55 (100.00)**	**11653.09 (100.00)**

APPEXDIX-V

Table 4.10: Per hectare yield, value of output and cost of production per quintal of paddy

(Rs. / ha.)

S. No.	Particulars	Farm Size				
		Marginal	Small	Medium	Large	Average
1.	Input cost (Rs.)	10358.56	11265.92	12150.14	13611.55	11653.09
2.	Production (qtl.)					
a.	Main product	18.12	19.50	21.80	24.20	20.52
b.	By product	31.20	33.25	34.17	35.43	33.38
3.	Value of production (Rs.)					
a.	Main product	19204.88	21408.35	25214.95	29903.91	23403.47
b.	By product	1092.00	1163.75	1195.95	1240.05	1168.30
	Total value of production (Rs)	20296.88	22572.10	26410.91	31143.96	24571.77
	Cost of production (Rs. / qtl.)					
a.	Main product	540.91	547.96	532.10	540.06	540.89
b.	By product	17.86	17.46	16.10	15.30	16.60

APPEXDIX-VI

Table 4.11: Cost and returns of paddy on the sample farms for different group of farms

(Rs. / ha.)

S. No.	Particulars	Farm Size				
		Marginal	Small	Medium	Large	Average
1.	Input cost (Rs.)	10358.56	11265.92	12150.14	13611.55	11653.09
2.	Output value	20296.88	22572.10	26410.91	31143.96	24571.77
3.	Net income (Rs.)	9938.32	11306.18	14260.77	17532.41	12918.68
4.	Family labour income (Rs)	12153.43	13120.48	15503.39	18488.41	14543.38
5.	Farm business income	13697.59	14754.80	17409.08	20514.61	16273.30
6.	Input-Output ratio	1:1.96	1:2.00	1:2.17	1:2.28	1:2.11

APPENDIX-VII

List of Economically NTFPs of Chhattisgarh State

S. No.	Common Name	Parts used	Botanical Name
1.	Tendu Leaves	Leaves	*Diaspyrosmelanoxylon*
2.	Sal Seed	Seed	*Shorearobusta*
3.	Mahua	Flower	*Madhucaindica*
4.	Harra	Fruit	*Terminalia chebula*
5.	Tamarind	Fruit and pulp	*Tamarindusindica*
6.	Baheda	Fruit	*Terminaliabellirica*
7.	Chironjee	Nut	*Buchananialanzan*
8.	Lac	Insect extract	*Kerrialacca*
9.	Aonla	Fruit	*Phyllanthusemblica*
10.	Baibiding	Fruit	*Embeliatsjaram-cottam*
11.	Mahul Leaves	Leaves	*Bauhinia vahlii*
12.	Honey	Insect extract	*Apisdorsata*
13.	Karanj Seed	Seed	*Pongamiapinnata*
14.	Kalmegh	Whole plant	*Andrographispaniculata*
15.	Bael	Fruit	*Aeglemarmelos*
16.	Nagarmotha	Roots	*Cyperusrotundus*
17.	Van Tulsi	Seed	*Ocimumgratissimum*
18.	Ber Fruits	Fruit	*Zizyphusmauritiana*
19.	Tikhur	Root powder	*Curcuma angustifolia*
20.	Van Jeera	Seed	*Vernoniaanthelmintica*