

## Role of NTFPs Among Forest Villagers in a Protected Area of West Bengal

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**KEYWORDS** Protected Area. Forest Villagers. NTFPs. Dependency

**ABSTRACT** People of rural India especially forest dwellers extract non-timber forest products (NTFPs) from forest for both commercial as well as consumption purposes. Various studies showed that poorest forest dwellers are highly dependent on NTFPs to sustain daily requirements of family needs. In protected areas, people's access to collect NTFPs has been either prohibited or restricted as per Wildlife Protection Act. The present study is an attempt to assess the extent of dependency on NTFPs after declaration of Buxa as protected area, dynamics of collection of NTFPs, people's perception about NTFPs collection etc. The study reveals that more than half of total families are dependent on NTFPs to supplement their daily requirements. Moreover, tribal populations are most dependent on NTFPs at BTR among all the social categories. It is observed that number of species as well as quantity of NTFP collection for sale increased considerably over the years. This might be due to the fact that villagers are increasingly dependent on NTFPs as potential income source as employment opportunity reduced drastically due to ban on clear felling coupes and artificial regeneration of plantations with the creation of Tiger Reserve. It is revealed that primary collectors i.e. local villagers are not getting remunerative price though secondary and tertiary collectors, in particular, are making maximum profits from NTFPs. Forest villagers of BTR regard NTFPs as more consistent and stable source of income with declining forest departmental works and crop depredation by wild animals.

### INTRODUCTION

Rural populace especially forest dwellers in India depend on the forests not only to supplement their domestic requirements for foods, fodder, fibre and medicines but also to supplement their incomes by selling part or all of their collection in local markets. In India, more than 41 million tribals and forest dwellers derive their earnings from these products after consuming about 60% of collected NTFPs for personal use (Prasad, 1985). NTFP is potentially obtainable from about 3000 species found in the forests of India. NTFP collection, an important source of income for forest dwellers and rural poor, varies from state to state ranging from 5.4 to 55 percent. Moreover, 60% of NTFP is consumed as food or as a dietary supplement especially during lean season by forest dwellers. In Manipur, India alone, nearly 90% of the population depends on forest products as a major source and some 250000 women are employed in collecting forest products (FAO, 1992). In Bastar district of Madhya Pradesh, about 75 % of forest dependent people supplement their food by tubers, flowers and fruits all the year round (Khare, 1998). In a household based survey at Midnapur forests, it was observed that of the 122 uses of plants or their parts listed by the people,

the maximum were for food (44), followed by fuel (39) and medicinal purposes (18) (Malhotra et al., 1991).

Various study reveal that it is the poorest households with agricultural lands, livestock, adult males that are predominant collectors of forest products (Malhotra et al., 1991; Hegde and Daniel, 1992). NTFPs are estimated to generate 70% of all employment in the Indian forestry sector. Commercial NTFPs alone are estimated to generate Rs.3 billion annually. One study estimated that NTFP collection generates over 2 million person years of work annually (Shiva, 1995). In addition, millions of individuals are employed in NTFP processing and marketing.

With the promulgation of Wildlife protection Act, access to collection of NTFP and fishing has been prohibited in some states causing deteriorating relationship between forest department and forest users group. However, some states have given free access to a number of NTFP collection and fishing. These primarily include fodder grasses, dry and fallen twigs and branches, leaf litter and leaves and where available mushrooms, edible tubers, flowers, fruits and medicinal herbs. But more valuable NTFP are excluded from free access (e.g. cashew nuts, bamboo and fibrous grasses) (Sarin et al., 1998).

In addition, local communities do not get the full incomes they should from NTFP. They often get only collection charges even for products that have a very high market value. There are also products for which appropriate prices have not been set in the market. Sometimes marketing channels do not even exist. The market price for the NTFP, or the profits from products goes to middleman contractors, traders, industry etc.

Buxa Tiger Reserve (BTR) at northern West Bengal constituted in 1983 as 15<sup>th</sup> Tiger Reserve of India after curving Buxa forest division. For last 100 years, forest villagers are residing within BTR. Villagers collect NTFPs from forest to sustain daily needs of the households. But there is no systematic study on the extent of dependence, socioeconomic dynamics of villagers relating to NTFPs, especially after creation of Tiger Reserve.

**Importance of Buxa Tiger Reserve:** BTR is situated in Alipurduar Subdivision of Jalpaiguri district of Northern West Bengal on the border with Bhutan and Assam. It has 760.87 Sq.Kms. of forests (comprising the 385.02 Sq.Kms. core area and 375.85 sq. Kms Buffer zone) [Das, 1999]. It represents several elements of biodiversity of North East India. No other Tiger Reserve of India (except Namdapha) matches Buxa in richness and diversity of species. About 60% of floral endemic species of northeast India are available in Buxa. The faunal diversity represents 68 species of mammals, 41 species of reptiles, 246 species of birds, 4 species of amphibians, 65 species of fishes and 500 species of entomofauna. The floral diversity represents 352 species of trees, 133 species of shrubs, 189 species of herbs, 108 species of climbers, 154 species of orchids, 36 species of grasses and reeds, 6 species of canes and 4 species of bamboos (Sinha and Das, 2003). Indian Tiger, Leopard, Clouded Leopard, Jungle Cat, Civet Cat, Jackel, Mongoose, Fox are main carnivores. Among herbivores, Elephant, Gaur, Sambar, Chital, Barking deer, Hog deer, Wild pig etc. are predominant in BTR. For researchers, BTR provides important source for gaining knowledge about biological and human dimensions, as many endangered, threatened and rare species of flora and fauna co exist with diverse ethnic groups and their culture for years.

**The People:** At present, there are 37 forest villages exist in BTR out of which 10 forest villages within Sanctuary area of BTR

(Das, 1999). Within villages, diverse ethnic groups are living over hundred years. Nepali community is most dominant ethnic group in BTR (Das, 2000). Rava community comes next in order.

The Park is fringed by 34 Tea gardens and 46 revenue villages on Western and Southern side (Considering 2 km from Park boundary). The total population impacting the Park is almost 0.27 million (1991 census). This population has a fairly high representation of Scheduled Castes and Schedule Tribes, which are listed in the Indian Constitution for positive action for development. Predominant ethnic groups in revenue villages are migrant Bengalees, Muslims, Rajbanshis etc.

People residing in and around the Tiger Reserve are very poor. There is no industry except Tea. Agriculture is the main occupation, mainly by traditional methods, resulting in only one crop annually. Most of the people living in non-Tea Estate areas depend primarily on rain fed agriculture. Their income is also supplemented by animal husbandry, selling of areca nuts, bamboos. NTFPs collection is another important source of income for forest villagers. Due to creation of Tiger Reserve, reduction in forest harvesting, extent of creation and maintenance of plantations has meant substantial reduction in employment of both forest villagers and fringe dwellers. The main season of unemployment is winter (December – March).

**Earlier Studies at BTR:** Buxa Tiger Reserve is biologically very rich particularly in terms of diversity of flora and fauna. Local people sustain their daily needs from forest products of this Reserve. A survey conducted by Tapan Katham in 1998, revealed that 43 species have been used by local people for own use as well as for selling. During 1997-98, a total of 624.05 metric tones of NTFP have been collected. The market value in the primary collectors level is over 26.0 lakhs. The exporters sell at more than four times of that value. Value of NTFP collected from trees, shrubs and climbers accounts for over 78% of the total export. In terms of parts collected, it is revealed that fruits, seeds, pods and kernels come from 22 species, which accounts for 58% of the total value of entire collection at exporters level. Local people collect and sell about 75% of NTFP used for decoration. NTFP used as dyes, resins, detergents constitute about 9% of the total value at exporters level. Medicinal herbs are collected

from 6 species that constitute 6% of the total value at exporters level (Das, 1999).

But there is no study about which category of people collect , relative contribution of NTFP in annual family income , level of transaction of NTFP, socio economic dynamics of NTFP collectors, peoples perception etc. Under these circumstances, an attempt has been made here to study: i) extent of dependency of villagers on NTFPs as family income; ii) relative contribution of NTFPs in annual family income; iii)category wise variation of NTFP collection among villagers, if any; iv) year wise income distribution and type of NTFP collected by villagers; v) trend of NTFP collection for sale; vi) dynamics of NTFP collection; vii) peoples perception about NTFP collection.

**MATERIALS AND METHODS**

In order to study extent of dependency, trend and dynamics of NTFP collection within PA, structured and semi-structured questionnaire was administered in some forest villages of BTR. For this purpose, 11 forest villages were selected. Data were collected through group discussion comprising members of Executive committee as well as general members of the Forest protection committees. NTFP collectors are also interviewed during the survey. As the data not based on door to door survey, there might be some probability of errors. Data were also collected from various Range records where available to assess extent of NTFP collection as far as possible. Fieldwork was done from mid July 2001 to August 2001. Data analysed here, mainly concentrate on NTFPs of commercial values. To assess relative contribution of NTFPs on annual family income, one village was selected for in depth study. Household level data from the villagers of Bhutia basti were collected during survey conducted in early 2000. Information was obtained on landholding of each family, type of cultivation, source of family income, NTFPs collected by each household and annual income from major sources especially from NTFPs. Number of plant species and their parts used by forest villagers for various purposes were reanalyzed based on report of Silvicultural (North) division, Siliguri of Dept. of Forests, Govt. of WB on NTFP of Buxa Tiger Reserve in 2002.

**RESULTS**

**Distribution of Species and Their Parts Used for Various Purposes:** From analysis, it is revealed that villagers collect maximum species for medicinal purpose (Table 1). Forest villagers use more than 30% of all species for domestic purposes in BTR. It is observed that villagers use leaves of various species (36.4%) for various purposes in BTR (Table 2). Whereas, fruits of various plant species (15.6%) comes second in order. For medicinal purpose, people use maximum leaves (24) as parts of species.

**Table 1: Distribution of usable plant species for various purposes in BTR**

| Purpose            | Number of species | Percentage |
|--------------------|-------------------|------------|
| Domestic           | 40                | 30.53      |
| Fodder             | 21                | 16.03      |
| Decorative         | 10                | 7.63       |
| Cottage Industries | 15                | 11.45      |
| Medicinal          | 45                | 34.35      |
| Total              | 131               | 100.00     |

**Table 2: Distribution of various parts of species used by forest villagers of BTR**

| Parts of species | Dome-<br>stic | Deco-<br>ration | Fod-<br>der | Medi-<br>cinal | Cottage<br>Indu-<br>stries | Perce-<br>ntage |
|------------------|---------------|-----------------|-------------|----------------|----------------------------|-----------------|
| Fruit            | 13            | 3               |             | 5              | 3                          | 15.58           |
| Seed             | -             | 2               |             | 2              |                            | 2.60            |
| Flower           | 2             | 2               |             | 2              |                            | 3.90            |
| Leaf             | 9             |                 | 21          | 24             | 2                          | 36.36           |
| Bark             | 7             |                 |             | 4              | 1                          | 7.80            |
| Root             | 3             |                 |             | 7              |                            | 6.49            |
| Stem             | 5             |                 |             | 3              | 4                          | 7.80            |
| Rhizome          | 2             |                 |             | 3              |                            | 3.25            |
| Pods             | 7             |                 |             |                |                            | 4.54            |
| Whole            | 2             | 2               |             |                |                            | 2.60            |
| Miscellaneous    | 6             | 2               |             | 1              | 5                          | 9.09            |
| Total            | 56            | 11              | 21          | 51             | 15                         | 100.00          |

**Families Dependent on NTFP Collection:** From analysis , it is revealed that more than 54% of total families are sustaining their livelihoods from sell of NTFPs (Table 3 ). In addition, poor, marginalized people use small timber for house construction; thatch for roof; edible roots and tubers, mushrooms, leaf litter and leaves, flowers and fruits as substitute of staple foods especially during lean seasons ; medicinal herbs for healing etc.

It is also observed that more than 75% of families of four villages collect commercial NTFPs among studied villages. In two villages, more than 50% families are dependent on NTFP sale. About 90% families of Teamari FV collect NTFPs of economic value from PA.

**Table 3: Category wise distribution of families in forest villages who are dependent on NTFP collection (for sale) at BTR**

| Name of the forest village | No. of families involved | % of families | Category-wise distribution (in %) |      |       |
|----------------------------|--------------------------|---------------|-----------------------------------|------|-------|
|                            |                          |               | ST                                | SC   | GEN   |
| Godamdabri FV              | 200                      | 30.0          | 91.7                              | 5.0  | 3.3   |
| Dalbadal FV                | 60                       | 33.3          | 50.5                              | -    | 50.0  |
| Nimati FV                  | 130                      | 50.0          | 100.0                             | -    | -     |
| East Garam FV              | 130                      | 42.3          | 100.0                             | -    | -     |
| Garo and Pampu Basti       | 216                      | 30.1          | 53.8                              | 7.7  | 38.5  |
| Dakshin Panbari FV         | 72                       | 55.6          | 100.0                             | -    | -     |
| Santrabari FV              | 78                       | 76.9          | 25.0                              | 8.3  | 66.7  |
| Buxa Road FV               | 89                       | 78.6          | 14.3                              | -    | 85.7  |
| Jainty FDH                 | 193                      | 28.5          | 18.2                              | 27.3 | 54.5  |
| Bhutiabasti FV             | 72                       | 83.3          | 5.0                               | 3.3  | 91.7  |
| Teamari FV                 | 34                       | 88.2          | 3.3                               | 33.3 | 63.4  |
| Total %                    | 1274                     | 54.25         | 51.07                             | 7.72 | 41.25 |

A look at category wise distribution reveal that more than 50% families are Scheduled Tribe

**Table 4: Distribution of average income from sale of Non Timber Forest Produce in some forest villages of BTR**

| Name of the forest village | No. of months/year (maximum) | Average range of income per family/day (Rs.) | Average yearly income per family (approx) (Rs.) | Major types of NTFP collection for sale   |
|----------------------------|------------------------------|--|---|---|
| Godamdabri FV              | 2                            | 20-40  | 4000-5000                                       | Simul floss   |
| Dalbadal FV                | 2                            | 20-40  | 4000-5000                                       | Simul floss   |
| Nimati FV                  | 3-4                          | 30-50  | 4500-6000                                       | Mushrooms, Totola, Teenphali, Lali fruits etc.  |
| East Garam FV              | 2-3                          | 50-200                                       | 5000-9000                                       | Honey; Mushrooms etc.   |
| Garo and Pampu Basti       | 6-7                          | 40-100                                       | 7000-10000                                      | Mushrooms, Totola, Teenphali, Lali fruits; Odal; Chikrasi, Chilauni, Narkeli, Dheki creeper etc.  |
| Dakshin Panbari            | 3-4                          | 30-70  | 3500-5500                                       | Lali fruits, Mushrooms, Cane etc.   |
| Santrabari FV              | 5-6                          | 30-75  | 6500-10000                                      | Mushrooms, Timboor, Gila, Teenphali, Lali fruits; Odal; Chilauni, Narkeli, Ritha, Malagiri, Amloki, Broom sticks etc..  |
| Buxa Road FV               | 6-7                          | 35-80  | 7000-10000                                      | Mushrooms, Timboor, Teenphali, Lali fruits; Odal; Chilauni, Narkeli, Ritha, Malagiri, Amloki, Kainchi pata Broom sticks etc..   |
| Jainty FDH                 | 5-6                          | 40-80  | 6000-10000                                      | Mushrooms, Timboor, Teenphali, Lali fruits; Odal; Chilauni, Narkeli, Ritha, Malagiri, Amloki, Kainchi pata Broom sticks, Dhundul, Gila Monjito, Nagbel, Satamul, Shikakai etc.. |
| Bhutiabasti FV             | 6-7                          | 35-70  | 3500-9000                                       | Mushrooms, Timboor, Teenphali, Lali fruits; Odal; Chilauni, Narkeli, Ritha, Malagiri, Amloki, Kainchi pata, Broom sticks etc..  |
| Teamari FV                 | 3-4                          | 20-35  | 2500-4000                                       | Mushrooms, Lali fruits, Totola, Peepul, Broom stick etc.  |

category out of total number of families involved in NTFP collection. Another 40% families belong to general category who are mainly from Nepali community.

**Variation in Family Income from NTFP**

**Sale:** It is observed that average income per year from NTFP sale varies from village to village. Average income level ranges from Rs.2500/- to Rs.10,000/- per year. Though villagers collect NTFP round the year (except 2-3 months), they collect maximum NTFP from November to May each year (Table 4). Range of average income varies from Rs.20/- to Rs. 200/- per day. Most common type of NTFPs are golden and spongy fungus, *totola (Oroxylum indica)*, *odal (Sterculia villosa)*, *lali (Amoora wallichii)*, *chilauni (Schima wallichii)*, *teenphali*, *narkeli*, broom sticks etc. Villagers of Godamdabri and Dalbadal villages only collect *simul* flosses and pods from forest. Interestingly, only East Garam villagers collect honey from forests among all studied villages and sell directly to markets/huts. In addition, villagers of Buxa Road, Jainty, Bhutiabasti are illegally collecting *Kawla* barks for sale, which are used as cheap raw materials for incense sticks for last 3-4 years. Collection of *Kawla* barks decreased due to non availability of *Kawla* trees in the forest. It is learnt that recently they are

**Table 5: Relative contribution of NTFPs on annual income of sampled families of Bhutia bastee FV**

| Range of annual family income | Percentage of family | Mean family income | Relative contribution on annual income |       |       |          |
|-------------------------------|----------------------|--------------------|--|-------|-------|----------|
|                               |                      |                    | Agriculture%                           | NTFP% | Milk% | Others*% |
| Upto Rs.9000                  | 22.73                | Rs.7800            | 32.82                                  | 39.74 | 6.41  | 22.31    |
| Rs.9001-11000                 | 31.82                | Rs.10207           | 33.73                                  | 37.23 | 9.24  | 19.80    |
| Rs.11001-Rs.13000             | 13.64                | Rs.11993           | 27.37                                  | 43.30 | 18.83 | 15.36    |
| Rs.13001-Rs.15000             | 13.64                | Rs. 14800          | 38.29                                  | 31.98 | 10.36 | 19.37    |
| Rs.15000 +                    | 18.18                | Rs.17775           | 32.91                                  | 38.11 | 14.06 | 14.91    |

\* include forest dept. works, live stocks etc.

collecting barks of *Rangchu* ( in Nepali ) to mix with *Kawla* barks for sale .

**Relative Contribution of NTFPs in Annual Family Income (A Case Study):** An in depth survey was carried out to examine in more detail, the extent of dependence on forest produce for income generation in subsistence economy. For this, one forest village i.e. Bhutiabastee, was selected within core areas of BTR. A total of 71 families are inhabitants of this village. Out of 71 families, household level data collected from 22 families (31%) to examine the various sources of income and the relative importance of income from NTFPs.

Bhutiabastee forest village is under the jurisdiction of Bhutiabasti beat of Jainty Range, East division of BTR. Nepali community is predominant ethnic group in Bhutiabastee. On category wise distribution, about 82% of members belong to general category. A total of 217 populations with family size 3.06 live in this village. The sex ratio is 1.23. They possess 3.68 cattle per family in average. They have 2.34 bighas of cultivable land per family. They solely depend on rain fed agriculture. About 40% of families have less than 2 bighas of land. Another 50% of families have less than 5 bighas of land. They cultivate maize, millet, mustard etc.

From household survey, it is revealed that cultivation, NTFP collection, sale of milk, livestock, and areca nuts are main annual family income source. About 90 % of families of Bhutiabastee collect NTFPs for sale. It is observed that sale of NTFP is primary occupation for 26% of families of this village. A summary of relative contribution of various activities to household income is given in Table 5. It is observed that about 60% of families' annual income within Rs.11000/-. On the other hand, only 18% of families have average annual income of Rs. 17775/- only. It is revealed that income from NTFPs contributed about 40% of total annual

income on average of forest villagers of this village.

**Trend of NTFP Collection:** According to Range level records, various parts of at least 33 species are collected by villagers of BTR for sale. In general, it is observed that collection of NTFP for sale increased appreciably from 1998-1999 to 2000 – 2001. It is revealed that villagers collected various parts of 12 species in 1998-1999 to 18 species in 1999–2000. In 2000-2001, villagers collected various parts of 26 species for sale. Collection of broomsticks increased remarkably from 1998-1999 to 2000-2001. It is about 20000 sticks in 1998-1999 to 13.38 lakhs of sticks in 2000-2001 (Table 6). NTFPs like mushrooms, *totola* fruits, *Odal* pods, *simul* (*Bombax ceiba*)flosses and pods collection increased more than 100% from 1999-2000 to 2000-2001 . Whereas, *lali* fruits, *chilauni* pods collection increased by more than 35% from 1999-2000 to 2000-2001. Villagers of Buxa Road, Jainty, Bhutia basti collect maximum broom sticks from Tashigaon, Tobgaon, Jainty, Santrabari , border areas of India and Bhutan etc.

**Extent of Collection at Secondary Collectors Level:** To assess extent of NTFP collection, status of collection in 2000 of three major secondary collectors of NTFP operating in BTR were considered here. It is revealed that a total of various parts of 30 species were collected for sale in the year 2000 by three major secondary collectors. It is observed that about 12 lakhs of pieces of golden fungus were collected from primary collectors in a single year i.e. 2000 (Table 7). Whereas, *lali* fruits (*phata*) collection is more than 12 tonnes in a single year. Collection of *odal* fruits, *teenphali* by three major secondary collectors is about 6 tonnes and 3.75 lakhs of piece respectively.

In the year 2000, Jagadish Oraon of Jainty FDH, has collected more than 20 lakhs of

**Table 6: Trend of major NTFPs collection for sale by forest villagers of BTR**

| Types of NTFPs | Quantity (in Tonnes) ** |           |            |            |
|----------------|-------------------------|-----------|------------|------------|
|                | 1998-1999               | 1999-2000 | 2000-2001  | 2001-2002* |
| Mushrooms      | 21.76                   | 16.76     | 40.91      | 4.42       |
| Lali fruits    | 13.96                   | 25.36     | 34.97      | 8.4        |
| Totola         | 0.6                     | 3.7       | 16.38      | 1.5        |
| Odal           | 4.44                    | 13.16     | 34.40      | 25.28      |
| Chikrasi       | 5.4                     | -         | 22.5       | 0.25       |
| Narkeli        | 3.48                    | 12.28     | 10.09      | 0.95       |
| Chilauni       | 7.2                     | 1.24      | 1.72       | 0.6        |
| Nakpheni       | -                       | -         | 188000pcs  | 9000pcs    |
| Teenphali      | 1.24                    | -         | 13.0       | -          |
| Simul          | -                       | 3.7       | 11.31      | -          |
| flossandgum    |                         |           |            |            |
| Broom          | 20000pcs                | 968000pcs | 1338000pcs | 156000pcs  |
| Sticks         |                         |           |            |            |
| Dheki creeper  | -                       | -         | 60bundles  | -          |

\* figures upto August ,2001 ; \*\* based on records available in various Ranges of BTR

Note: Actual figures might be at least 20-30% more than data presented here due to non availability of records in some ranges and possible pilferage of NTFP from forest without any transit permit etc.

**Table 7: Collection of major NTFPs for sale in the year 2000 by three major secondary collectors of BTR**

| Type of NTFPs     | Jagadish Oraon of Jointy | Prem Bh.Thapa of Rajabhatkhawa | Prema Lama of Buxa Rd. | Total quantity (in tones) |
|-------------------|--------------------------|--------------------------------|------------------------|---------------------------|
| Golden fungus     | 50000pcs                 | 100000pcs                      | 150000pcs              | 120000pcs                 |
| Spongy fungus     | 74000pcs                 | 60000pcs                       | 150000pcs              | 284000pcs                 |
| Phata Lali        | 1.3                      | 10.0                           | 1.0                    | 12.3                      |
| Gota Lali         | 40000pcs                 | 100000pcs                      | 100000pcs              | 240000                    |
| Totola            | 1500pcs                  | 1200pcs                        | 700pcs                 | 3400pcs                   |
| Odal              | -                        | 6.0                            | 0.2                    | 6.2                       |
| Chikrasi          | -                        | 500000pcs                      | -                      | 500000pcs                 |
| Narkeli           | 7000pcs                  | 50000pcs                       | 7000pcs                | 64000pcs                  |
| Chilauni          | 6.0                      | 2.5                            | 0.2                    | 8.7                       |
| Nakpheni          | 1500pcs                  | -                              | -                      | 1500pcs                   |
| Teenphali         | 35000pcs                 | 300000pcs                      | 40000pcs               | 375000pcs                 |
| Simul flossandgum | 0.073                    | -                              | -                      | 0.073                     |
| Broom Sticks      | 2000000pcs               | -                              | 50000pcs               | 2050000pcs                |
| Dheki creeper     | -                        | 100000pcs                      | -                      | 100000pcs                 |

\*pcs = pieces

broomsticks from primary collectors for sale. He also collected 6 tonnes of *chilauni* pods in the same year from local primary collectors. On the other hand, Prem bahadur Thapa , a secondary collector, collected 10 lakhs pieces of golden fungus and 6 tonnes of *odal* fruits in the year 2000. It is also revealed that among the secondary collectors, Jagadish Oraon of Jointy areas collect maximum varieties of NTFPs in BTR so far reported.

**Dynamics of NTFP Collection at Various Levels:** It is learnt that extent of NTFP collection is somewhat dependent on demand in market created by external agents (i.e. tertiary collectors) of Calcutta, Alipurduar, Assam, Coochbehar. Firstly, the tertiary collectors place their orders

on various items of NTFPs to secondary collectors (as agents) who are operating within BTR. For these orders, they usually give a lump sum amount as advance to secondary collectors. Next, on the basis of orders of various items, secondary collectors involve local people of their regions for collection of various items of NTFPs. It is revealed that local villagers (i.e. primary collectors) get minimum price for collection of NTFPs.

After collection of NTFPs , secondary collectors apply to Range officer /EDC secretary for transit permit . Range officer of concerned Range issue a permit for transportation of NTFP with revenue charge of Rs.12/- per bag. Collected revenue will be deposited to EDC account. These

revenues will be utilized for welfare of the members of concerned EDC/FPC. For example, in Jainty EDC, Rs. 7896/- and Rs. 14810/- were deposited in EDC account for 1999-2000 and 2000-2001 respectively. This fund are utilizing by giving credit to members for emergency periods like disease, marriage, rituals and ceremonies etc.

Price of NTFPs varies on the basis of availability of resources. Usually, secondary collectors sell NTFPs to tertiary collectors with minimum 20-30% profits from the price given to primary collectors. The tertiary collectors sell the NTFPs at 3 to 4 times more than that of secondary collectors level. It is learnt that all the members, young or adult, male or female in the families usually collect NTFPs as far as possible. Collection of NTFPs increases during lean season. It is also revealed that the secondary collectors often give advance payment during pujas, crisis periods to primary level collectors. The advance payment in each year readjusted by collection of NTFPs from concerned primary collector. For example, Jagadish Oraon of Jainty Range gave advance of Rs.27000/- to 20-22 families (Rs.400/- Rs.1500/-) of Bhutia basty and 10 families of Jainty (Rs.200-Rs.500/-) in the last year which readjusted from value of collection of NTFPs. By this, there is a possibility to deprive primary collectors from proper price for collection.

**People's Perception About NTFP Collection:** In general, people believed that NTFP collection increased with time in BTR. It is increased due to ban on CFC operation, less opportunity of alternative income sources especially among forest villagers of BTR. Forest villagers believed that NTFP plays an important source of income for sustaining daily needs. Villagers opined that there is continuous threat of loss in yields from cultivation due to depredation of elephant, wild boar, monkey etc. In other words, 'variances in income from the extraction of NTFPs is much less than that of income from other vocations, including that the collection of NTFPs constitutes the most reliable source of income (Hegde et.al.1996)'. Villagers felt that NTFP collection decreased in some areas of BTR due to increased protection, dwindling resources in forest, absence of tertiary collectors etc. Primary level collectors reported that they have little knowledge about channels of NTFP markets. However, some secondary collectors of this Reserve have tried to sell the NTFPs to

exporters at Calcutta but failed due to huge cash transactions, delay in payment, reduction of market value of NTFP by agents etc.

## DISCUSSION

Forests and forest resources, primarily NTFPs, play an important role in the viability and survival of forest dwellers in India because of the importance of forests in their social, cultural and economic survival. Status of NTFPs in the livelihood strategies of forest households is highlighted by the very favourable income returns to the time spent in collection and stability of income from NTFPs (Yadama et al., 1997). Forest villagers of BTR, who are residing for more than 100 years, are also collecting NTFPs from forest to sustain daily needs of the households.

From analysis, it is revealed that more than 54% of total families are sustaining their livelihoods from sell of NTFPs. It is observed that average income per year from NTFP sale varies from village to village which ranges from Rs.2500/- to as high as Rs.10 thousand per year. From household level data, it is revealed that sale of NTFP is primary occupation for 26% of families of the sampled village. It is also revealed that income from NTFPs contributed about 40% of total annual income on average of forest villagers of sampled village, which is consistent with other findings reported so far (Ramamani, 1988; Hegde et.al.1996). It is noted that contribution of NTFP is even more than agricultural activities to annual family income of sampled families of Bhutia basty FV. Sale of milk, livestock, forest dept. works etc. are also contributed to annual income. Earlier, employment in clear felling coupes and artificial regeneration (CFC) operation, boulder collection, was major source of income. But, with the creation of protected area, strategy of commercial forestry shifted to conservation forestry, leading to ban on CFC operation and removal of boulder collection. Under this condition, income of NTFPs plays a crucial role to sustain daily needs of the villagers. People regard NTFPs as more consistent and stable source of income in subsistence economy. This is even more important as there is continuous threat of loss of agricultural products due to depredation of elephant, wild boar, monkey etc.

In BTR, primary collectors are highly

dependent on agents for NTFP sale. As a result, they are not getting remunerative price for collection. Price of NTFPs varies on the basis of availability of resources. Usually, secondary collectors sell NTFPs to tertiary collectors with minimum 20-30% profits from the price given to primary collectors. The tertiary collectors sell the NTFPs at 3 to 4 times more than that of secondary collectors. It is observed that number of species as well as quantity of NTFP collection for sale increased appreciably over the years. It is felt that extent of collection of NTFPs increased considerably, reflecting dependence on forest by forest villagers of BTR to sustain family needs due to drastic reduction of employment opportunity with the creation of Tiger Reserve. A small-scale industry of broomsticks on cooperative basis could set up in those areas so that maximum profits would go to primary collectors as broomstick extraction increased considerably in recent years. Furthermore, women self help groups can be engaged as agents for NTFPs for more profits at secondary collectors level and thereby strengthening self help groups already exist in BTR.

#### ACKNOWLEDGEMENTS

I want express my gratitude to Rakesh Sinha, Ex Field Director and R.K.Sinha, Field Director, Buxa Tiger Reserve for suggestions and constant help. I want express my sincere gratitude to Professor Amiya Kumar Bagchi and DR. Ramkrishna Chatterjee of the Institute of Development Studies Kolkata for inspiration. I am thankful to DFDs of BTR for providing vehicular support. I am thankful to all the staffs of concerned Ranges and Beats of BTR for co-operation. Last but not the least, I am thankful to concern villagers especially Jagadish Oraon, Prem Bh.Thapa ,Prema Lama who helped me a lot during data collection in the field.

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