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**Pankaj Kumar Chandel**  
 Research Scholar, Department of  
 Forestry, College of Agriculture,  
 IGKV, Raipur, (C.G.), India

**RK Prajapati**  
 Department of Forestry, College  
 of Agriculture, IGKV, Raipur,  
 (C.G.), India

**Ramesh Kumar Dhurwe**  
 Department of Forestry, College  
 of Agriculture, IGKV, Raipur,  
 (C.G.), India

## Documentation of traditional collection methods of different NTFPs in Dhamtari forest area

**Pankaj Kumar Chandel, RK Prajapati and Ramesh Kumar Dhurwe**

### Abstract

Study entitled "Documentation of traditional collection methods of different NTFPs in Dhamtari forest area." The study was carried out in three study sites Dugli, Nagri and Sihawa range Dhamtari, district of Chhattisgarh. The study reveals that the total 41 plants were documented belongs to 16 Tree, 5 Shrubs, 7 herbs, 5 Grasses, 7 Climbers and 1 Bio – products species. All NTFPs are not harvested and collected in the study area, a few NTFPs, which have commercial and domestic values in the market, are collected by local people. The products, which are collected by people, are flower, fruit, rhizome, tuber, mushroom, leaves, bamboo shoots, seed, etc. Among all these viz. fruits, seeds and leaves especially *Buchanania lanzan* (Char fruit), *Diospyros melanoxylon* (Tendu) and *Bauhinia vahlii* (Mahul) leaves are largely collected. 41 different plant species extracted as most abundant NTFPs, which were used for food, fodder, fuel, medicine, household and commercial purpose.

**Keywords:** NTFPs, Bio – product, harvested, extracted, medicine, commercial purpose.

### Introduction

The forests provide timber and non-timber forest products besides invaluable environmental services. Traditionally Non Timber Forest Products (NTFPs) refer to all biological materials other than timber extracted from natural forests for human and animal use and have both consumptive and exchange value. Globally NTFP / NWFP are defined as "forest products consisting of goods of biological origin other than wood, derived from forest, other wood land and trees outside forests". Different terms like secondary, minor or non-timber forest products (NTFPs) are also being used by governments, institutions and academics.

NWFP may be gathered from the wild, or produced in forest plantations, agro-forestry systems and from trees outside forests. Examples of NWFP include products used as food and additives (edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, gums), fibres (used in construction, furniture, clothing or utensils), resins, plant and animal products used for medicinal, cosmetic or cultural purposes.

In Bastar area of Chhattisgarh, about 75 % of forest dependent people supplement their food by tubers, flowers and fruits all round the year. 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). 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.

### Materials and Methods

The study three sites were selected and two villages in each site are selected in Dhamtari district of Chhattisgarh and data was collected on winter and summer season when the NTFPs are extracted from forests and sold in the market. The data was collected on the basis of questionnaire developed for this experiment regarding, processing of the harvested NTFP before storage and marketing of the produce. Out of total tribal families residing in each selected village, a representative sample of 20 percent respondents were selected by purposive sample. Conservation practices of tribal's was also observed and recorded during the study.

### Results and Discussion

The collected 41 plants as NTFPs in which 16 Tree, 5 Shrubs, 7 herbs, 5 Grasses, 7 Climbers and 1 Bio – products were collected and sold in the market as well as their own use. As evident from Table 02 mostly fruits were collected as crude method like cutting of branches or shaking of tree. The fruit collection was carried out of *Syzygium cumuni*, *Diospyros melanoxylon*, *Aegle marmelos*, *Tamarindus indica*, *Semecarpus anacardium*, *Schleichera oleosa*, *Embllica officinalis*, *Buchanania lanzan*, *Mangifera indica*, *Terminalia chebula*,

### Correspondence

**Pankaj Kumar Chandel**  
 Research Scholar, Department of  
 Forestry, College of Agriculture,  
 IGKV, Raipur, (C.G.), India

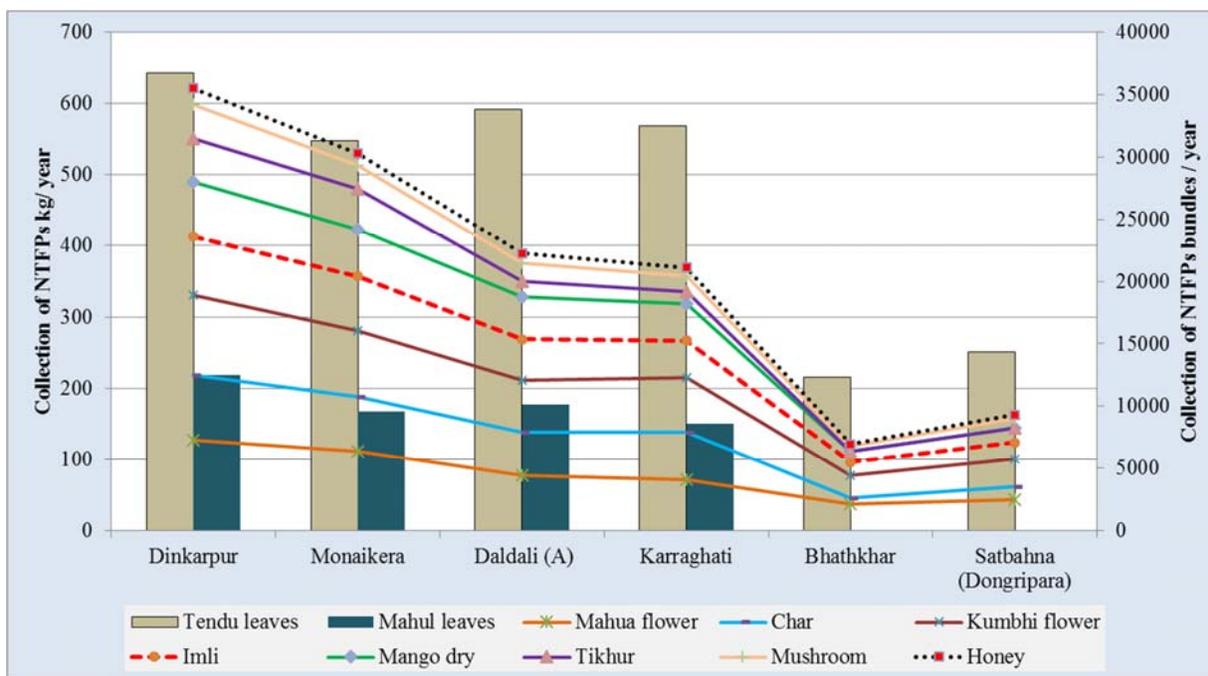
*Terminalia bellirica* and *Azadirachta indica* etc. The medicinal plant Kalmegh was uprooted before maturity of seed thus next year production declines. The most of the trees, shrubs, herbs and grasses were used for medicinal purposes. Tribal people use the roots of many trees, shrubs, herbs and grasses as medicine. The fresh leaves of plants were also used as vegetable and climber medicine such as *Bauhinia variegata* (Kachanar) *Cassia tora* (Charota) leaves. The people used to cut the branches of *Bauhinia variegata* for collecting its leaves and pods. The leaves of *Cassia tora* was also collected maximum before maturity of plants for the use of vegetable purpose thus seed production affected. Lakh and Cocoons were also collected by the tribals from the forest two major source tree species *Shorea robusta* and *Terminalia tomentosa* was found in study area for rearing Cocoon (Kosa), and one major source tree species *Schleichera oleosa* was found in

study area for Lac production people called Kusumi Lac. The Bio- product Honey were also collected by the people in the study area but the collection of Honey was high in rates/kg Dugli site but low price in Sihawa site this may be high production of honey.

The collection has been done by traditional crude method, which may call as destructive harvesting of NTFPs. The collected material like leaves, flowers, seeds, fruits, and rhizomes of different NTFPs for their livelihood in unscientific manner because of this the regeneration of species badly affected. The quality of produce would not good as demanded in the market therefore, the produce dose not fetch good price in the market. The collection of produce and its post-harvest technique is playing a positive role to preserve quality material for longer duration and fetching good price in market.

**Table 1:** Family wise NTFPs collected in different study sites during (2016-17)

Village	Tendu leaves ( <i>Diospyros meloanoxylon</i> ) (bundle/year)	Mahul leaves ( <i>Bauhinia vahlii</i> ) (bundle/year)	Mahua flower ( <i>Madhuca latifolia</i> ) (kg/year)	Char ( <i>Buchanania lanzan</i> ) (kg/year)	Kumbhi flower ( <i>Careya arborea</i> ) (kg/year)	Imli ( <i>Tamarindus indica</i> ) (kg/year)	Mango dry ( <i>Mangifera indica</i> ) (kg/year)	Tikhur ( <i>Curcuma arometica</i> ) (kg/year)	Mushroom (kg/year)	Honey (kg/year)
<b>Site 01 Dugli range</b>										
Dinkarpur	36750	12500	128	91	112	82	77	61	47	23
Monaikera	31300	9570	112	76	93	76	66	57	33	17
Average	34025	11035	120	83.5	102.5	79	71.5	59	40	20
<b>Site 02 Nagri range</b>										
Daldali (A)	33800	10150	78	60	74	57	59	22	26	13
Karraghati	32460	8590	72	66	77	52	51	18	21	12
Average	33130	9370	75	63	75.5	54.5	55	20	23.5	12.5
<b>Site 03 Sihawa range</b>										
Bhathkhar	12300	0	37	9	32	18	16	0	7	3
Satbahna (Dongripara)	14350	0	43	19	39	23	21	0	13	5
Average	13325	0	40	14	35.5	20.5	18.5	0	10	4
Overall Average	26826.67	6801.67	78.33	53.50	71.17	51.33	48.33	26.33	24.50	12.17



**Fig 1:** Village wise collection of various NTFPs in Bundles/kg per year

**Table 2:** Collection techniques of NTFPs used by local inhabitants and scientific methods for sustainable utilization**Trees**

S. No.	Local name	Traditional method	Scientific method
		Collection	Collection
1.	Bel ( <i>Aegle marmelos</i> )	i) Unripe fruits were also collected which has less commercial importance. ii) During fruit collection they damaged the plant by cutting the branches.	i) Completely ripen yellow coloured fruits should be collected. ii) Sickled bamboo sticks should be used for collection of selected fruits so that skull of fruit may not break.
2.	Char ( <i>Buchanania lanzan</i> )	i) People collected fruit from March-April when it is immature. ii) People used to cut its branches for collection of seeds.	i) Completely ripen black colour fruit should be collected good quality of chironjee. ii) Sickled bamboo stick should be used for collection of fruits. iii) Leader should be used for pricking the fruit from the tree.
3.	Kachnar ( <i>Bauhinia variegata</i> )	i) Pods and leaves were collected after cutting the branches.	i) Collection should be done by hand plucking.
4.	Bahera ( <i>Terminalia bellirica</i> )	i) Unripe green fruits were also collected and sometimes cut the branches for collection.	i) Completely ripen brown colored fruits selected for collection. ii) Sickled bamboo sticks should be used to collect the fruits from trees. iii) The best method to climb on tree and good fruits will be pricked for the market.
5.	Aonla ( <i>Emblica officinalis</i> )	i) Immature green fruits were also collected with ripen fruits. ii) People used to cut branches for collecting fruits and sometimes fruits are also damaged. iii) The whole tree cut from the base.	i) Completely ripen yellow fruits should be selected for collection. ii) Fruits should be collected with the help of sickled bamboo stick.
6.	Tendu leaves ( <i>Diospyros melanoxylon</i> ) Tendu fruit	i) During collection of tendu leaves branches were also cut which affects the leaves production of next year. ii) Leaves, which are not suitable for the purpose, were also collected. i) Branches were cut to collect fruits from the tree or big stone thrown in the bole of the tree to damage the bark.	i) Only undamaged and disease free leaves should be collected. ii) All diseased and damaged leaves should be removed before drying. i) Fruits should be collected without cutting the branches with the help of sickles bamboo stick or to climber on tree and collect the ripen fruit.
7.	Bhelwa ( <i>Semecarpus anacardium</i> )	i) Before complete ripening the fruit people starts the collection therefore, unripe fruits were also collected.	i) Collection should be done with bamboo sticks when tree has maximum ripen fruits.
8.	Mahua Flower ( <i>Madhuca latifolia</i> )	i) People put fire to clean floor below the tree, which may cause forest fire.	i) Brooms should be used to clean floor. It is very easy practice. ii) The Tarpaulin is put in the floor so that soil will not stick with the flower or mosquito net may be used to tied in the tree.
9..	Jamun ( <i>Syzygium cumuni</i> )	i) During collection, unripen fruits also collected.	i) Shake only selected branches to collect fruits or use bamboo stick. ii) Below the tree the net will be tied so that fruit may not be damage.
10.	Kusum ( <i>Schleichera oleosa</i> )	i) Collection of fruits start early even unripe fruits also collected result low oil percentage in seed. ii) During collection of fruits they also cut the branches therefore next production is affected.	i) Fruits should be collected when its colour becomes light yellowish. ii) Sickled bamboo stick should be used to collect the fruits form tree.
11.	Imli ( <i>Tamarindus indica</i> )	i) Fruits are not collected properly even unripe and diseased fruits also collected and put together. The destructive fruit collection methods were used like they cut the big branches during collection of fruits.	i) Collection should be done with sickled bamboo stick and ripen fruits may be collected with care.
12.	Mango ( <i>Mangifera indica</i> )	i) Fruits not collected properly people used bamboo stick for breaking the fruit. ii) During fruit collection they damaged the plant by cutting the branches.	i) Well mature fruits are collect for preparation of pickle. ii) Sickled bamboo sticks should be used for collection of selected fruits so that fruit may not damage.
13.	Sal ( <i>Shorea robusta</i> )	i) Green leaves are collected directly from the trees. ii) Gums are collected by scraping it from the tree bark. The deep and wound made in the bole.	i) Sharp knife is used for collecting leaves. ii) Clean gums free from dirt are collected. Scientific methods will be applied for collection of gum from the tree.
14.	Harra ( <i>Terminalia chebula</i> )	i) Unripe green fruits were also collected and sometimes cut the branches for collection.	i) Completely ripen brown colored fruits selected for collection. ii) Sickled bamboo sticks should be used to collect the fruits from trees.
15.	Neem ( <i>Azadirachta</i> )	i) Fallen Unripe green fruits are collected from ground, leaves are collected directly from stem.	i) Ripen, sound fruits need to be collected. Leaves are collected without harming the tree.

	<i>indica</i> )		
16.	Kumbhi ( <i>Careya arborea</i> )	i) Flowers are collected from ground.	i) Collected flowers should be free from unwanted material like soil particle, insect-pests etc.

**Shrubs**

S. No.	Local name	Traditional method	Scientific method
		Collection	Collection
1.	Ainthe ( <i>Helicteres isora</i> )	i) During collection of fruit, twig and branches are also cut.	i) Leaves should be collected by hand plucking. ii) Fruit is having medicinal value will be collected fully ripen pod and properly dried.
2.	Ber ( <i>Zizyphus mauritiana</i> )	i) The collection started before complete ripen the fruits. ii) They shake all branches thus unripe fruit also fall down.	i) Shake only selected branches for collection of fruits or use bamboo sticks. ii) The only ripe good quality fruit will be collected and sold in the market or sun dried fruits properly stored.
3.	Chhindi ( <i>Phoenix acaulis</i> )	i) At the time of cutting leaves people also cut new or young branches ii) For their convenience they prune some branches then cut selected branches. iii) During collection of leaves the stem portion also destroyed.	i) Choose only useful mature branch before cutting. ii) Branches which has matures leaves should be selected for harvesting. iii) Selected branches should be cut without disturbing other branches with sharp knife.
4.	Karonda ( <i>Carissa carandus</i> )	i) Fruit collection starts before complete maturity.	i) Only ripen fruits should be selected for collection. ii) Hand pricking is the best option for this species.
5.	Jangli chameli ( <i>Jasminum arborescens</i> )	i) During collection of leaves and flowers the branches also cut.	i) Collection should be done by hand plucking and post harvest drying or oil extraction will be done within week.

**Herbs**

S. No.	Local name	Traditional method	Scientific method
		Collection	Collection
1.	Charota ( <i>Cassia tora</i> )	i) Before maturity leaf collection started resulted that seed production affected. ii) The whole plants were also harvested before seed maturity.	i) When plant has 70 percent leaves that time its collection should be done. ii) The seed should be collected when seed colour turns green to light brown before breaking the pod.
2.	Mushroom	i) People put fire to clean forest floor for collection of mushroom, which may cause forest fire.	i) Forest floor should be clean with Bamboo sticks or Broom for collecting mushroom.
3.	Kalmegh ( <i>Andrographis paniculata</i> )	i) Leaves and fruits were harvested sometimes before maturity also.	i) Harvesting should be carried out at maturity of plants and seed. ii) The whole plants will be uprooted and the root must washed with water and drying in sun.
4.	Tikhur ( <i>Curcuma angustifolia</i> )	i) Immature rhizomes are collected. ii) Whole parts of rhizomes are collected by digging the soil without leaving any part of it for future regeneration.	i) Mature rhizomes are collected. ii) Some part of rhizome is left in the soil for future regeneration of the plant.
5.	Safed musli ( <i>Chlorophytum tuberosum</i> )	i) Immature roots and tuber are collected. ii) Whole parts of roots and tuber are collected by digging the soil without leaving any part of it for future regeneration.	i) Mature roots and tuber are collected. ii) Some part of tuber or roots and tuber is left in the soil for future regeneration.
6.	Kali musli ( <i>Curculigo orchioides</i> )	i) Immature roots and tuber are collected. ii) Whole parts of roots and tuber are collected by digging the soil without leaving any part of it for future regeneration.	i) Mature roots and tuber are collected. ii) Some part of tuber or rhizome is left in the soil for future regeneration.
7.	Gengi ( <i>Curcuma zedoaria</i> )	i) Immature rhizomes are collected. ii) Whole parts of rhizomes are collected by digging the soil without leaving any part of it for future regeneration.	i) Mature rhizomes are collected. ii) Some part of rhizome is left in the soil for future regeneration.

**Grasses**

S. No.	Local name	Traditional method	Scientific method
		Collection	Collection
1.	Munsel ( <i>Iseilema nervosum</i> )	i) For collecting whole plants were dug-outs with root.	i) Some plants should be left. ii) Uprooting should be avoided.
2.	Kans ( <i>Saccharum spontaneum</i> )	i) The whole spikes of Kans cut from the base.	i) Only those spikes should be harvest, which are suitable for broom making.
3.	Sukul ( <i>Heteropogon</i> )	i) Continuous grazing is used.	i) Compartment grazing should be allowed.

	<i>cantortus</i> )		
4.	Phulbahari ( <i>Thysanolacns maxima</i> )	i) The whole spikes of Phulbahari cut from the base to obtain more material.	i) Only those spikes should be harvest, which are suitable for broom making.
5.	Bans ( <i>Dendrocalamus strictus</i> )	i) During bamboo extraction young culms destroyed. ii) For their convenience in cutting of Bamboo they cut immature other culms.	i) Only mature old culms select for harvesting ii) Culms should be cut in inverted u shape (∩) so that old culms cut at first.

### Climbers

S. No.	Local name	Traditional method	Scientific method
		Collection	Collection
1.	Mahul ( <i>Bauhinia vahlii</i> )	i) Immature leaves are also collected to obtain more material. ii) They cut the climbers from the base to obtain large quantity and save time.	i) Only mature leaves should be selected for collection ii) Sharp knife should be use to harvest leaves. iii) Branches should be cut from those places which give more new branches for further leaf collection. iv) Open roots should be covered with soil. v) The leaves should not be collected from damaged climbers at least one year. vi) Buckles should be used for tying mahul leaves.
2.	Baichandi ( <i>Dioscorea hispida</i> )	i) Immature Tubers are collected. ii) Whole parts of Tubers are collected by digging the soil without leaving any part of it for future regeneration.	i) Mature Tubers are collected. ii) Some part of tubers is left in the soil for future regeneration.
3.	Ramdatun ( <i>Smilax macrophylla</i> )	i) Immature climbers also collected with the mature material. ii) Poor quality instrument used to cut climbers.	i) Only those climbers should be cut with sharp knife, which can give good fibre.
4.	Karukand ( <i>Dioscorea bulbifera</i> )	i) Immature leaves, tuber and roots are collected. ii) Whole parts of tuber and roots are collected by digging the soil without leaving any part of it for future regeneration.	i) Mature leaves, tuber and roots are collected. ii) Some part of tuber or roots is left in the soil for future regeneration.
5.	Anantmool ( <i>Hemidesmus Indicus</i> )	i) Collect whole climbers.	ii) During collection some climbers should be left for the regeneration of plant.
6.	Bodal ( <i>Cucumis melo agrestis</i> )	i) Continuous cutting of climbers for fodder purpose. ii) Immature fruits are collected.	i) Climbers should be cut in fixed interval. ii) Only mature fruits are collected.
7.	Amarbel ( <i>Cuscuta reflexa</i> )	i) Collect whole climbers.	i) It is a parasite for the other plant so it should be removed as a whole.

### Bio- product

S. No.	Local name	Traditional method	Scientific method
		Collection	Collection
1.	Honey	i) Smoke used for collection of honey. In the process of putting smoke to protect them -self from honeybees attack, some honeybees also die.	i) A special dress should be worn during collection honey and apply water on honeycomb. ii) All the honeybees should be carefully separated from honey comb then cut the upper portion of the comb with sharp knife. Collected honeycomb should be squeezing for honey collection.

### Conclusion

It concluded that collection has been done by traditional crude method, which may call as destructive harvesting of NTFPs. The collected material like leaves, flowers, seeds, fruits, and rhizomes of different NTFPs for their livelihood in unscientific manner because of this the regeneration of species badly affected. The quality of produce would not good as demanded in the market therefore, the produce dose not fetch good price in the market. The collection of produce and its post-harvest technique is playing a positive role to preserve quality material for longer duration and fetching good price in market.

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