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Research Article

LIVELIHOOD CONTRIBUTIONS OF FOREST RESOURCES TO THE TRIBAL COMMUNITIES OF JHARKHAND

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ABSTRACT
The present study documents livelihood contributions of forest resources to the tribal communities of Bundu block in Ranchi district of Jharkhand state. The study is based on personal interviews of the selected respondents through interview schedule, personal observations and participatory rural appraisal tools i.e. semi-structure interview and focus group discussion carried out in the sample villages using multi-stage random sampling technique. The results of the study revealed the average size of forest based direct paid employment among sample population was 19.82 mandays/ household/ annum and the mean income earned from these activities was `2199.70/ household/ annum in the area. The livelihood generation from forest based secondary employment in the study area was nil as no wood-based or Non-Timber Forest Products (NTFPs) based enterprises were established. The average income and unpaid employment generated through NTFPs based self-employment for the surveyed households in the area were estimated to be `4791.16/ Household/ annum and 88.22 mandays/ annum. The percentage of households involved in collection of various NTFPs varied from 1.83% to 100% and that involved in NTFPs marketing was 1.83% to 80.49% in the sample villages. The NTFPs had variable abundance according to season and the collection of these NTFPs recorded variations with the seasonal occupation of the local people. The overall income and employment generated through forest resources including direct employment, secondary employment and self-employment was ` 6990.85/ household/ annum and 108.04 mandays/ household/ annum among surveyed population. The agriculture contributed major share (36.23%) of total household annual income followed by forest resources (25.05%), labour (9.74%), livestock (8.86%), business/ shop (8.72%), service (6.77%) and others (4.63%). Thus, the livelihoods promotion among tribal people needs a shift of paradigm focusing on forest resources to keep pace with current development and future challenges in the area.

Key Words: *Livelihood, Forest Resources, Non-Timber Forest Products (NTFPs), Employment, Income, Tribe, Bundu, Ranchi, Jharkhand.*

INTRODUCTION
The analysis of prosperity and poverty from livelihood point of view to understand rural inequalities has attracted considerable attention during the last few decades in India and other developing countries (Sharma, 2005). The livelihoods among tribal communities in India is complex, dynamic and multidimensional phenomenon, the perception of which varies with geographic location, type of community, age, gender, education, fluctuations in resources, services and infrastructures and social, economic, cultural, ecological and political determinants (Kumar *et al*., 2009). Agriculture constitutes main source of livelihood among tribes in India playing a vital role in national economy, rural development, employment and occupation, agro-industries, food and nutrition security, growth and survival, social, economic and cultural conditions and poverty alleviation (Surayya *et al*., 2008). About 70% of the population mainly depends on rain fed agriculture characterized by low productivity, un-predictive weather and calamities, degraded soil with low fertility, un-protective irrigation and degraded

natural resources (Chakraborty *et al*., 2009). These factors aggravated the problems of poverty, migration, unemployment, under-employment, food insecurity and malnutrition for millions of tribal people in India (Mourlin, 2007). The capability of agriculture and livestock production to form sustainable livelihoods of tribal poor is in continuous decline because the current overall endowments of production, distribution of productive assets and productive abilities are out of alignment with what is needed (Maske *et al*., 2011). Consequently, the tribal people are constrained to earn their livelihoods from forest resources.

Forest is the second largest land use in India after agriculture covering 21.05% of the total geographical area of the country (Anonymous, 2011). Forests provide a wide spectrum of livelihoods for tribal communities in the form of direct employment, self-employment and secondary employment. The direct employment is provided by the forest department and other departments (rural development, agriculture and co-operatives) in the form of managerial, technical, research, planning and executive jobs. The other direct employments consisted of labour force for rural masses generated by these departments under regular forestry activities are growth, development and maintenance of the forests, research and training, survey of forest resources, protection and conservation of forest resources, soil and water conservation, harvesting, collection and processing of Non-Timber Forest Products (NTFPs), preparation of nurseries, fencing, soil working, transplanting, planting, tending operations, watering, fertilizer and pesticide application, protection and management of plantation and infrastructure development. The self employment in forestry create local people's livelihoods through the sale of fuel wood and fodder, grazing, lopping and grass cutting, forest based handicrafts and cottage industries, sericulture, lac cultivation, bee keeping, charcoal burning, leaf plate making, liquor making, rope making and basketry, medicines, collection, processing and marketing of Non-Timber Forest Products (NTFPs), cultivation of agricultural crops under agri-silvicultural practices, livestock rearing, social and farm forestry and availing of rights and concessions. The application of local skills and village-level technology in wood-based and small-scale forest-based enterprises provide secondary employment and livelihood opportunities for tribal people, main amongst are saw milling, rayon, pulp and paper, ply wood and panel products, wood seasoning and preservation, tanning, sports goods, match splints, veneers, wooden boxes, bamboo and cane products, agricultural implements, furniture, structural wooden items, musical instruments, *bidi* making, educational goods, wood carving, wooden utensils *etc.* (Pant, 1984; Gera, 2002).

Forests of Bundu block in Ranchi district of Jharkhand state are the common thread in all aspects of life, whether it is birth, marriage, livelihood or death among the tribal communities. The forests include a considerable wealth of land, soil, water, fuel, minerals, natural vegetation, wild life including the aquatic fauna *etc.* having multifarious uses constitute an important source of livelihood among tribal people in the block. Forests are the source of revenue, employment, shelter, housing materials, cloth, ornament, fuel, fodder/ grazing, timber, food, vegetables, medicines, fertilizer, fibre, floss, oilseed, cottage industries and handicrafts and other Non-Timber Forest Products (NTFPs) besides playing a vital role in the environmental amelioration in the block. The main tribal communities in the block are *Munda*, *Oraon*, *Lohara etc.* They are socially, educationally, economically and politically backward with accompanying impediments of illiteracy, poverty, malnutrition, superstitions, addictions, ignorance and exploitation. They have their own ways of life, traditions, cultural identities and customary modes of living closely intertwined with nature. Unemployment and under-employment features are inherent in the block causing low income and miserable life of the households. The forest resources are the important contributor to the total livelihoods among the tribal communities in the block. Forest development integrated with agricultural and industrial progress has great potential to enhance livelihood security, poverty reduction and food security for vulnerable section of society including illiterate, unskilled, resource-poor, jobless, landless and labourers people in the area. Keeping the above facts in view, the present study has been undertaken to investigate the livelihood contributions of forest resources to the tribal people of Bundu block in Ranchi district of Jharkhand.

MATERIALS AND METHODS

Study Area

The present study has been conducted in purposively selected Bundu block of Ranchi district in Jharkhand during 2009-10 (Map 1.). The block lies on the undulated surface of Chhotanagpur plateau between $23^0$11'- $23^0$18' North latitude and $85^0$35'- $85^0$58' East longitude at an altitude of 337 meters (1105 feet) above mean sea level with total geographic area of 25097 ha. The existing land use pattern in the block is as un-irrigated cultivable land (69.25%), forest (17.44%), irrigated cultivable land (8.41%), culturable wasteland (3.59%), unculturable wasteland (1.29%) and non-agricultural use (0.02%). The block falls under Bundu Range of Khunti Forest Division with mostly northern tropical dry deciduous forest (5B/C2). The block consists of 88 revenue villages with a population of 62509 (31624 males and 30885 females) living in 11495 households consisting of 60.74% schedule tribe, 4.76% schedule caste and rest 34.50% belongs to other groups. The population density, number of persons per family and sex ratio are 249.07 per sq. km, 5.44 and 978 female/1000 male, respectively. The literates in the block are 23572 (16084 males and 7488 females) accounting 44.02% of the total population. The block falls under tropical climate with three distinct and well marked seasons, summer, monsoon and winter. The average annual normal rainfall is 1413.60 mm; the mean minimum temperature is 24°C and mean maximum temperature is 37.2°C in the block.

Map 1: Location of the study area

Socio-Economic Profile of the Sample Villages

The sample villages have considerable percentages of forest areas ranging between 11.83 to 42.81%. The average land area under cultivation is 53.06% of the total geographical area in the sample villages. Majority (75.74%-100%) of the population in the villages are dominated by schedule tribes with an average sex ratio of 1028.22. The literacy rate is very low varying between 24.52 to 44.87%. Average size of land holding per household was found to be 1.89 ha. The percentage of main workers was 43.48 to 61.71%. The total livestock population ranged from 660 to 1752. The sample villages have a very low infrastructure development. The educational, medical, social, economic, agricultural, irrigation, communication and transportation facilities in the sample villages are very poor. A brief socio-economic profile of the sample villages has been given in the Table 1.

Table 1: Socio-economic profile of the sample villages

Particulars	Villages								
	Korda	**Jojoda**	**Husirhatu**	**Banaburu**	**Nehalgara**	**Hesapiri**	**Roredih**	**Kuchidih**	**Ghagrabera**
A. Land use (ha)									
Village area	617.58	185.40	497.63	322.49	143.33	308.23	195.59	211.67	397.02
Forest	264.37	21.93	242.84	65.56	31.03	54.20	24.48	44.79	70.30
Cultivable waste	115.85	22.56	15.58	19.99	24.41	16.39	20.26	39.25	33.22
Other uses	27.48	23.10	25.77	21.36	15.07	22.22	20.74	26.43	42.12
Net sown	209.88	117.81	213.44	215.58	72.82	215.42	130.11	101.20	251.38
Irrigated	11.18	18.06	11.89	77.12	2.02	3.90	1.25	10.73	35.34
Un-irrigated	198.70	99.75	201.55	138.46	70.80	211.52	128.86	90.47	216.04
B. Human Population (no.)									
Households	196	60	110	122	63	83	34	77	71
Total population	973	305	629	682	360	431	161	378	467
Male	400	125	292	294	148	183	62	156	202
Female	424	138	264	279	143	190	76	154	208
Children	149	42	73	109	69	58	23	68	57
C. Sex ratio									
ST	1080	1104	897	973	893	1000	1277	1000	1030
SC	-	-	-	821	-	-	-	-	-
Others	973	-	1091	1056	1308	1778	1067	920	-
All	1060	1104	904	949	966	1038	1226	987	1030
D. Literacy (no.)									
Total	241	118	248	239	77	146	55	76	180
Male	190	74	172	173	57	95	33	55	126
Female	51	44	76	66	20	51	22	21	54
E. Caste structure (no.)									
ST	678	263	533	434	231	348	107	262	410
SC	-	-	-	102	-	-	-	-	-
Others	146	-	23	37	60	25	31	48	-
F. Land holding (households)									
Landless	17	2	2	5	5	-	-	5	-
Marginal	102	24	52	45	29	28	10	34	22
Small	44	18	24	36	17	26	9	24	18
Medium	25	10	22	28	9	18	8	9	16
Large	8	6	10	8	3	11	7	5	15
G. Employment status (no.)									
Total workers	481	158	252	313	142	224	60	171	253
Main	319	111	121	296	65	131	28	104	140
Marginal	162	47	131	17	77	93	32	67	113
Non-workers	343	105	304	260	149	149	78	139	157
H. Livestock population (no.)									
Bullock	209	115	152	193	83	127	40	65	105
Cow	232	219	309	204	153	287	49	114	95
Buffalo	78	39	43	63	32	44	17	40	36
Goat	554	129	381	444	135	370	116	206	184
Sheep	45	13	26	29	14	18	9	17	16
Pigs	68	18	43	47	18	26	13	24	30
Poultry	711	263	491	524	289	399	147	367	355
Duck	39	20	22	31	16	24	15	19	18
Turkey	4	-	-	2	-	2	-	1	-

Source: Census of India (2001) and Livestock census (2007).

Household and Market Survey

The multi-stage random sampling technique was employed to select the villages and the respondents. Nine sample villages namely, Korda, Jojoda, Husirhatu, Banaburu, Nehalgara, Ghagrabera, Hesapiri, Roredih and Kuchidih having around 10% sampling intensity of the block were selected using simple random sampling technique. A sample consisted of 164 respondents having 20% of the total number of the households comprising all categories of the land holders were drawn by simple random technique from the sample villages for household survey. Household heads were treated as respondents. The data on livelihood contributions of forest resources to the tribal people in terms of direct employment, secondary employment and self-employment were collected by personal interviews of the respondents through a well-structured pre-tested interview schedule developed for the purpose, personal observations of the interviewer and participatory rural appraisal tools i.e. semi-structure interview with key informants and focus group discussion. The data regarding forest resources based direct and secondary employment incorporated number of members employed, size of employment (mandays/ year) and income earned whereas the self employment included NTFPs collection, household consumption, sale, seasonality, size of employment (mandays/ annum) and income earned. The monetary value was calculated by multiplying the quantities of NTFPs with their local market rates ascertained by periodic market surveys. The annual household income consisted of various sources was also recorded. Simple statistical tools viz., frequency (f), average (x) and percentage (%) were used for analysis of the data as per Snedecor and Cochran (1967).

RESULTS AND DISCUSSION

Livelihood Generation from Forest Based Direct and Secondary Employment

The livelihood generation from forest based direct and secondary employment in the study site has been given in the Table 2. It is seen from the Table that the average size of forest based direct paid employment among surveyed population was 19.82 mandays/ household/ annum and the mean income earned from these activities was ` 2199.70/ household/ annum in the area. The Forest Department generates direct employment under regular forestry activities in forests generally in the form of casual labour in the study area. The main forest-based activities from which people derive employment and income are land preparation, nursery operations and plantation works, development of soil and water conservation measures, *tendu* leaf collection and bamboo works. The people were used to get contractual employment on a daily-wage basis for these forestry operations as the employment in these operations is largely sporadic owing to its seasonal nature.

Table 2: Livelihood generation from forest based direct & secondary employment (N=164)

Sl. No.	Forest based employment	Average size of employment (Mandays/ household/ annum)	Mean income (`/ household/ annum)
1.	**Direct employment**	19.82	2199.70
2.	**Secondary employment**	0.00	0.00
3.	**Total**	19.82	2199.70

Note: Wage rate = ` 111.00/ Manday

The livelihood generation from forest based secondary employment in the study area is nil as no wood-based or NTFPs based enterprises have been established so far in spite of availability of huge forest resources, labour input, skill and other opportunities. The area has greater prospects of establishment of

forest resources based enterprises which will strengthen forest based tribal livelihood systems through employment and income generation for unemployed people.

Livelihood Generation from NTFPs Based Self Employment

The details of livelihood generation from NTFPs based self employment in the sample villages have been given in the Table 3. The Table included data regarding household collection, consumption and sale of major NTFPs and income and employment generation from these NTFPs among surveyed population. It is evident from the data that *sal* leaf fetched highest earning (`208000/ annum) among surveyed households in the area followed by lac (`100500/ annum), fuel wood (`89600/ annum), tooth brush (`67200/ annum), fodder (`64000/ annum), *mahua* flower (`56760/ annum), mango (`31000/ annum), *chironji* (`25200/ annum), *ber* (`24000/ annum), *mahua* seed (`17424/ annum), *jamun* (`16800/ annum), tamarind (`13000/ annum), *koinar* tender leaf (`9600/ annum), *bhelwa* (`9600/ annum), bamboo corn (`7200/ annum), *kachnar* flower (`7200/ annum), *kusum* seed (`5850/ annum), *chiraita* (`4200/ annum), *phutkal* leaf buds (`4000/ annum), *tendu* fruit (`3500/ annum), toot (`3200/ annum), *bel* (`2991/ annum), jackfruit (`2625/ annum), *sal* seed (`2250/ annum), *rugra* and *khukhri* (`2250/ annum), *karanj* seed (`2200/ annum), *jirhul* flower (`1800/ annum), *harra* (`1500/ annum), *bahera* (`1200/ annum) and *barhar* (`1100/ annum).

The extraction and marketing of fodder generated highest unpaid employment opportunity of 6041 mandays/ annum among the people in the study site followed by fuel wood (4326.46 mandays/ annum), *sal* leaf (2421 mandays/ annum), tooth brush (532.80 mandays/ annum), lac (505.63 mandays/ annum), *mahua* flower (133.32 mandays/ annum), *ber* (71.00 mandays/ annum), mango (57.20 mandays/ annum), *jamun* (40.32 mandays/ annum), *mahua* seed (32.04 mandays/ annum), tamarind (31.00 mandays/ annum), *chiraita* (30.00 mandays/ annum), *rugra* and *khukhri* (28.20 mandays/ annum), *koinar* tender leaf (27.20 mandays/ annum), *bel* (22.94 mandays/ annum), *kachnar* flower (21.50 mandays/ annum), jackfruit (21.30 mandays/ annum), *bhelwa* (19.80 mandays/ annum), *sal* seed (18.00 mandays/ annum), *kusum* seed (15.60 mandays/ annum), bamboo corn (10.52 mandays/ annum), *toont* (9.70 mandays/ annum), *karanj* seed (8.80 mandays/ annum), *chironji* seed (8.40 mandays/ annum), *tendu* fruit (8.40 mandays/ annum), *phutkal* leaf buds (8.20 mandays/ annum), *barhar* (6.85 mandays/ annum), *jirhul* flower (5.60 mandays/ annum), *harra* (3.00 mandays/ annum) and *bahera* (2.40 mandays/ annum). The percentage of households involved in collection of various NTFPs varied from 1.83% to 100% while household's percentage involved in NTFPs marketing was 1.83% to 80.49% in the study villages. The bamboos are priced for its multifarious uses like, young culms (*Karla*) for pickle, culms for brooms, baskets, fans, sieves, fish trap, plates and other handicrafts making, sticks, huts, tool handles, fishing rods, hunting materials making *etc*. in the area. The *kachnar* flower and *koinar* tender leaf are important vegetables for the local population sold by quantifying them in handful (*Kheja*) basis in local *haats*. The collection and sale of *kusum* seed, *chiraita*, *toont*, *tendu* fruit, jackfruit, *phutkal* leaf buds, *bel*, *sal* seed, *karanj* seed, *rugra* and *khukhri*, *jirhul* flower, *harra*, *barhar* and *bahera* is comparatively sparse among the surveyed population in the study area. The *kusum* seed is traded for extracting oil consumed in cooking, lighting or lubrication and the residue oilseed cake is vended as cattle feed. The *chiraita* is a very important medicinal plant collected, dried, bundled and sold by the tribal people in local as well as urban markets. The *toont*, *tendu*, *bel* and *barhar* fruits are eaten for supplementing nutrition and health. The jackfruit is marketed unripe for vegetable and pickle, ripe as edible fruit and roasted/ boiled seed as edible item. The *phutkal* leaf buds and *jirhul* flower are consumed as vegetables by local communities making them important items of trade in the weekly *haats*. The oil extracted from *sal* seed is utilized for cooking, lighting and massage purposes and the residue oilseed cake is utilized as cattle feed while the oil extracted from *karanj* seed is vended for lighting, massage and medicinal value and the oilseed cake is used as fish poison. The *rugra* and *khukhri* are important wild mushroom constituting a significant component of diet playing a vital role in human nutrition and health of the tribal people in the area. The *harra* and *bahera* fruits are important constituents of well-known medicinal composition '*Trifala*' and as such the fruits are being collected and sold by the primitive societies traditionally in the area. The average

Table 3: Livelihood generation from important NTFPs based self-employment (N=164)

Sl. No.	Non-Timber Forest Products (NTFPs)	Households involved in collection	Collection (Kg/ annum)	Consumption (Kg/ annum)	Households involved in marketing	Sale (Kg/ annum)	Rate (`/ Kg)	Income (`/ annum)	Employment(Mandays/ annum)
1.	Sal (*Shorea robusta*) leaf	81 (49.39)	56.05 lac pieces	4.05 lac pieces	13 (7.93)	52 lac pieces	32/ 100 plates	208000	2421
2.	Lac	67 (40.85)	670	0.00	67 (40.85)	670	150	100500	505.63
3.	Fuel wood	164 (100)	616520	598600	28 (17.07)	17920	5	89600	4326.46
4.	Tooth brush Sal (*Shorea robusta*), Karanj (*Pongamia pinnata*), Neem (*Azadirachta indica*), Mahua (*Madhuca latifolia*)	164 (100)	10656 bundles	3936 bundles	14 (8.54)	6720 bundles	10/ bundle	67200	532.80
5.	Fodder	162 (98.78)	604100	591300	20 (12.20)	12800	5	64000	6041
6.	Mahua (*Madhuca latifolia*) flower	132 (80.49)	6666	990	132 (80.49)	5676	10	56760	133.32
7.	Mango (*Mangifera indica*)	131 (79.88)	2860	1310	31 (18.90)	1550	20	31000	57.20
8.	Chironji (*Buchanania lanzan*) seed	42 (25.61)	168	0.00	42 (25.61)	168	150	25200	8.40
9.	Ber (*Zizyphus mauritiana*)	115 (70.12)	3550	1150	15 (9.15)	2400	10	24000	71.00
10.	Mahua (*Madhuca latifolia*) seed	121 (73.78)	1602	150	121 (73.78)	1452	12	17424	32.04
11.	Jamun (*Syzigium cumini*)	42 (25.61)	2016	336	14 (8.54)	1680	10	16800	40.32
12.	Tamarind (*Tamarindus indica*)	24 (14.63)	1550	250	13 (7.93)	1300	12	13000	31.00
13.	Koinar (*Bauhinia purpuria*) tender leaf	80 (48.78)	1360	400	12 (7.32)	960	10	9600	27.20
14.	Bhelwa (*Semecarpus anacardium*)	35 (15.24)	990	350	16 (9.76)	640	15	9600	19.80
15.	Bamboo (*Bamboosa arudinacea*) corn	23 (14.02)	526	46	6 (3.66)	480	15	7200	10.52
16.	Kachnar (*Bauhinia variegata*) flower	71 (43.29)	1075	355	9 (5.49)	720	10	7200	21.50
17.	Kusum (*Schleichera oleosa*) seed	39 (23.78)	780	195	39 (23.78)	585	10	5850	15.60
18.	Chiraita (*Swertia angustifolia*)	3 (1.83)	30	0.00	3 (1.83)	30	140	4200	30.00
19.	Phutkal (*Ficus glabella*) leaf buds	5 (3.10)	410	10	5 (3.10)	400	10	4000	8.20
20.	Tendu (*Diospyros melanoxylon*) fruit	14 (8.54)	420	70	14 (8.54)	350	10	3500	8.40
21.	Toont (*Morus alba*)	33 (20.12)	485	165	4 (2.44)	320	10	3200	9.70
22.	Bel (*Aegle marmelos*)	30 (18.29)	1147 pieces	150 pieces	8 (4.88)	997 pieces	3/ piece	2991	22.94
23.	Jackfruit (*Artocarpus heterophylus*)	108 (65.85)	1065	540	21 (12.80)	525	5	2625	21.30
24.	Sal (*Shorea robusta*) seed	18 (10.98)	450	0.00	18 (10.98)	450	5	2250	18.00
25.	Rugra (*Lycoperdon spp.*) and Khukhri (*Agaricus compestris*)	34 (20.73)	141	51	15 (9.15)	90	25	2250	28.20
26.	Karanj (*Pongamia pinnata*) seed	22 (13.42)	220	0.00	22 (13.42)	220	10	2200	8.80
27.	Jirhul (*Indigofera arborea*) flower	10 (6.10)	140	20	3 (1.83)	120	15	1800	5.60
28.	Harra (*Terminalia chebula*)	3 (1.83)	30	0.00	3 (1.83)	30	50	1500	3.00
29.	Bahera (*Terminalia belerica*)	3 (1.83)	24	0.00	3 (1.83)	24	50	1200	2.40
30.	Barhar (*Artocarpus lakoocha*)	49 (29.88)	342.50	122.50	11 (6.71)	220	5	1100	6.85
31.	Total	-	-	-	-	-	-	785750	14468.18
32.	Average	-	-	-	-	-		4791.16	88.22

Note: Figures in the parentheses show percentages

income and unpaid employment generated through NTFPs based self-employment for the surveyed population in the area were computed to be ` 4791.16/ household/ annum and 88.22 mandays/ household/ annum. Non-Timber Forest Produces (NTFPs) play an important role in the livelihood support of tribal and forest dwellers in terms of subsistence, income and employment generation in the study area. The tribal people possess the traditional skill base, have access to the resource base and have conducive government policies on NTFPs management and trade.The forests provide complex mix support to the community year round. The availability of the forest produces along with the quantity varies from month to month. The household involvement in collection and marketing varies with the types of NTFPs, household consumption, availability and market price and socio-economic status of the people in the study villages.The marketing mechanism of almost all the NTFPs is predominantly individual oriented and majority of the NTFPs are sold in the raw form without any value addition except certain trivial functions fetching paltry income to the vendors. The individual selling mechanism of small surplus forest resources restricts the collectors to access the remunerative markets which require tradable quantity. The NTFPs markets are by and large imperfect and the aboriginal people do not get a fair return for their labour. The poor marketing infrastructure and lack of storage facilities compels them to sell off their produces to the first market contact that is generally the *haat* or the petty trader. The selling of almost all the forest resources is predominantly done in the local weekly markets where transaction takes place on a mutually agreed price quote between vendors and petty traders. Generally, the forest produces hits the market during the peak season where getting a better price becomes difficult due to competitive market situation. The middlemen invariably exploit collectors of NTFPs on account of prevailing malpractices, forced and distress sales. The introduction of collective marketing strategy, increasing trading period by proper storage, value addition measures and creation of marketing infrastructures can help the NTFPs collectors to fulfill the gap and get better prices for their forest produces. The findings are not unusual and a significant number of studies across the world have demonstrated the dependence of forest dwellers on non-timber forest products (NTFPs) for both subsistence and cash income (Godoy and Bawa, 1993; Barham *et. al*., 1995; Coomes and Barham, 1997; Mutwakil, 1998; Prasad, 1999; Kumar *et. al*., 2000; Vidhyarthi and Gupta, 2001; Anonymous, 2001; Lan *et. al*., 2002; De and Babu, 2003; Cord, 2005; Anonymous, 2005a; Anonymous, 2006; Mishra *et. al*., 2007; Shah and Sah, 2007; Sunderlin *et. al*., 2007; Redeppa, 2007; Sivaji, 2009; Singh and Quli, 2011 and Islam *et. al*., 2011).

Seasonality of NTFPs Collection and Trading

The seasonality analysis in terms of the local harvest and trading of the forest produces has been given in the Table 4. The NTFPs have variable abundance according to season and the collection of these NTFPs varies with the seasonal occupation of the local people. The NTFPs items thus gathered in the monsoon (June-July) are much less than in other seasons. The present situation reflects that all the major NTFPs are available for around 2-3 months except for fuel wood, fodder, *sal* leaf, lac and tooth brush and bulk (peak) trading seldom goes beyond 3-4 months. The availability of NTFPs is least during rainy season, whereas the summer, spring and autumn seasons witness a large quantum of NTFPs influx in the sample villages. The reduction in the number of NTFPs in the wet season is due to the fact that all the villagers, men and women are engaged in cultivation and secondly, collection and storage of NTFPs becomes very difficult. The NTFPs plant part viz., leaf, fruit, stem, seed, flower, tuber/ root, whole plant and twig are available throughout the year in the area.There are possibilities of increasing trading period of NTFPs to gain better price during the lean season. Many more challenges get associated with the primary producers which prevents them from getting better price for their NTFPs. The introduction of aggregation and local value addition measures can help NTFPs collectors to get better prices. Similarly, either by supporting primary collectors to have access to infrastructure or by creating marketing infrastructure producers can be supported to fulfill gap and gain access to remunerative markets. Overall in these circumstances collecting marketing (wherein a combination of aggregation and local value addition practices of no-change-in-form nature) holds key to increase price and support primary producers become market player.

The collective marketing strategy can be successfully introduced for all the prominent NTFPs like *sal* leaf, lac, fuel wood, fodder, tooth brush, *mahua* flower, *chironji*, mango, *mahua* seed, tamarind, *ber*, jamun, bamboo corn, *kachnar* flower, *koinar* tender leaf, *kusum* seed, *chiraita*, *toont*, *tendu* fruit, jackfruit, *phutkal* leaf buds, *bel*, *sal* seed, *karanj* seed, *rugra* and *khukhri*, *jirhul* flower, *harra*, *barhar* and *bahera* in the area.

Table 4: Seasonality of collection and marketing of important NTFPs in the study area

Sl. No.	Non-Timber Forest Products (NTFPs)	Month
		January, February, March, April, May, June, July, August, September, October, November, December
1.	Fuel wood	
2.	Fodder	
3.	Mahua (*Madhuca latifolia*) flower	
4.	Mahua (*Madhuca latifolia*) seed	
5.	Lac	
6.	Sal (*Shorea robusta*) seed	
7.	Koinar (*Bauhinia purpuria*) tender leaf	
8.	Kachnar (*Bauhinia variegata*) flower	
9.	Sal (*Shorea robusta*) leaf	
10.	Tamarind (*Tamarindus indica*)	
11.	Jackfruit (*Artocarpus heterophylus*)	
12.	Barhar (*Artocarpus lakoocha*)	
13.	Mango (*Mangifera indica*)	
14.	Ber (*Zizyphus mauritiana*)	
15.	Karanj (*Pongamia pinnata*) seed	
16.	Kusum (*Schleichera oleosa*) seed	
17.	Jamun (*Syzigium cumini*)	
18.	Chironji (*Buchanania lanzan*) seed	
19.	Tendu (*Diospyros melanoxylon*) fruit	
20.	Bamboo (*Bamboosa arudinacea*) corn	
21.	Rugra (*Lycoperdon spp.*) and khukhri (*Agaricus compestris*)	
22.	Phutkal (*Ficus glabella*) leaf buds	
23.	Chiraita (*Swertia angustifolia*)	
24.	Harra (*Terminalia chebula*)	
25.	Bahera (*Terminalia belerica*)	
26.	Bel (*Aegle marmelos*)	
27.	Bhelwa (*Semecarpus anacardium*)	
28.	Toont (*Morus alba*)	
29.	Jirhul (*Indigofera arborea*) flower	
30.	Tooth brush Sal (*Shorea robusta*), Karanj (*Pongamia pinnata*), Neem (*Azadirachta indica*), Mahua (*Madhuca latifolia*)	

Overall Livelihoods from Forest Resources

The overall income and employment generated through forest resources including direct employment, secondary employment and self-employment was ` 6990.85/ household/ annum and 108.04 mandays/ household/ annum among surveyed population. The percentage share of direct employment, self-employment and NTFPs based self employment to the total earnings from forest resources were 31.47%, 0.00% and 68.53% respectively and the mandays generated through direct employment, secondary employment and NTFPs based self employment from forest resources were 18.35%, 0.00% and 81.65% respectively (Figure 1&2).

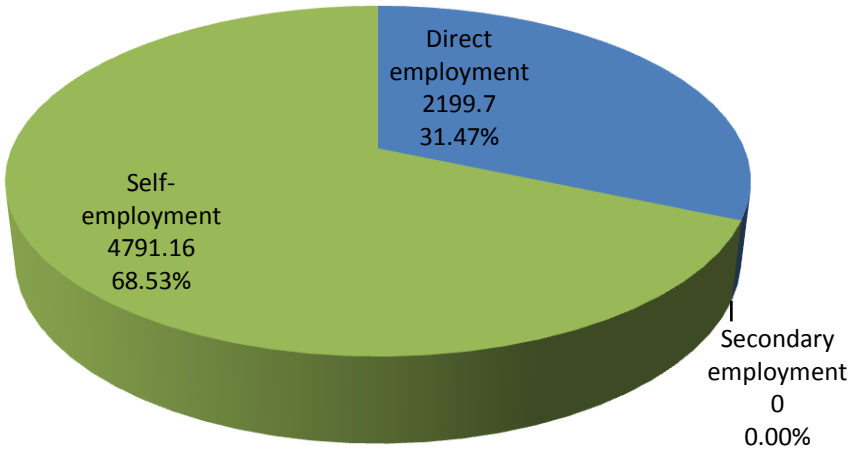

Figure 1: Income from forest resources based employments

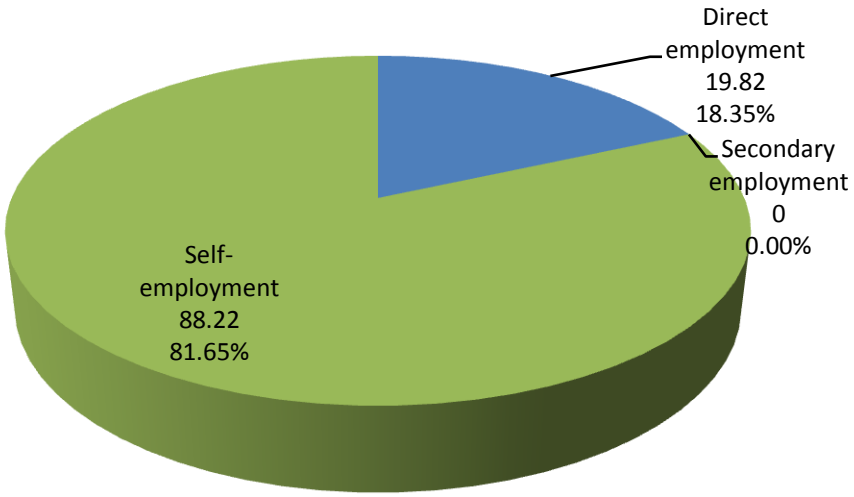

Figure 2: Mandays generated from forest resources based employments

The direct employment under regular forestry activities in forests by the Forest Department in the form of casual labour is sporadic owing to its seasonal nature while the livelihood generation from forest based secondary employment is nil due to lack of wood-based or NTFPs based enterprises in the area. The livelihood generation through NTFPs based self-employment is significant as the natural heritage supports huge richness and diversity of NTFPs in the area.

Contribution of Forest Resources to the Total Livelihoods

The structure of household annual income consisted of all off-farm and on-farm sources viz., agriculture, forest resources, labour, livestock, business/ shop, service and others in the study area has been depicted in the Figure 3. It is evident from the Figure that the average annual income/ household obtained from agriculture, forest resources, labour, livestock, business/ shop, service and others were computed to be`10109.76 (36.23%),`6990.85 (25.05%),`2719.51 (9.74%),`2472.56 (8.86%),`2432.93(8.72%),`1890.24 (6.77%) and `1292.68 (4.63%) among surveyed households in the sample villages. Thus, the forest resources are the 2nd important contributor to the total livelihood income streams among surveyed households in the study area. The forest resources are viewed as a viable source for both subsistence and cash income among the surveyed households as the alternative options are scarce or even absent, land for agriculture is in short supply and the returns to agriculture is low in the study area. In many households, the use of forest resources is not their primary source of livelihood but is complementary either on a part-time or full-time basis. The households engaged in land-based livelihood activities such as crop production and livestock rearing were using more quantity of forest resources for direct household consumption than households not participating in farming activities. The poorer households use greater amounts of forest resources for earning income than wealthier households. Although the cash earned from forest resources is small, participation in the trade is an important source of self-esteem, pride and independence, especially for women. The cash benefits resulting from marketing of forest resources are variable across households and are directly related to the degree of effort expended. The earnings from forest resources are used to meet other household needs and as asset base to secure livelihood perspectives such as education of children, wedding, investment in agricultural tools, capital for income generation activities, savings to cope in times of adversity and the like. Significant contribution of forest resources to the total livelihoods has been also reported by the studies made by Singh (2005), Sunderlin and Ba (2005), Mishra and Horo (2008), Gharai and Chakrabarti (2009), Sarmah and Arunachalam (2011) and Singh and Quli (2011).

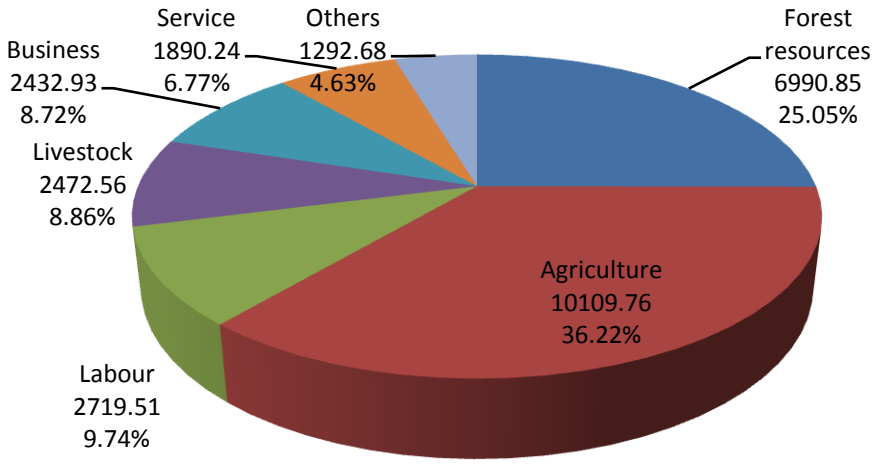

Figure 3: Contribution of forest resources to the total livelihoods

Conclusion

The study leads to conclude that the livelihoods of tribal communities in the area have traditionally been dominated by subsistence agriculture. However, the forest resources play a vital role in the livelihoods of tribal people through direct paid employment and NTFPs based self-employment. The NTFPs like *sal* leaf, lac, fuel wood, fodder, tooth brush, *mahua* flower, *chironji*, mango, *mahua* seed, tamarind, *ber*, jamun, bamboo corn, *kachnar* flower, *koinar* tender leaf, *kusum* seed, *chiraita*, *toont*, *tendu* fruit, jackfruit, *phutkal* leaf buds, *bel*, *sal* seed, *karanj* seed, *rugra* and *khukhri*, *jirhul* flower, *harra*, *barhar* and *bahera* are integral part of day-to-day livelihood activities and traditional life style for tribal people in the area. The policies on NTFPs management & trade in Jharkhand also ensured a number of rights and concessions in access of forest resources for tribal people. Therefore, the livelihoods promotion among tribal people needs a shift of paradigm focusing on forest resources to keep pace with current development and future challenges in the area. There is enormous scope in improvement of NTFPs based livelihoods for tribal population through proper storage and value addition to NTFPs, domestication and commercialization of NTFPs, organized marketing system, proper refinement and dissemination of indigenous technologies, institutional support in training and skill development, appropriate extension and communication networks and exploring new forest resources based livelihood avenues through wood and NTFPs based secondary employments in the area. The interventions visualized needs to be implemented efficiently for all-round development of the tribal people and ecological stability in the study area.

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