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Contribution of Mahua (*Madhuca latifolia* Macb.) to Household Economy in Odisha

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ABSTRACT

This paper evaluates the contribution of Mahua (*Madhuca latifolia* Macb.) to the household economy of tribes in 10 different provinces of Odisha based on field survey. The annual income from 'NTFPs other than Mahua' was found highest (Rs 5,412) in Koraput and lowest (Rs 1,072) in Bolangir. The annual income from flowers and seed oil of Mahua was found highest (Rs 22,306) in Bolangir and lowest (Rs 7,631) in Baleswar. The contribution of Mahua products to the total income was maximum contribution in Bolangir (95.49%) and minimum in Nuapada (60.23%). Similarly, contribution of Mahua products to the total income generated from all sources was found maximum (21.94%) in Sundargarh and minimum (14.12%) in Baleswar.

Keywords Mahua, Forest dwellers, Livelihood, Economic contribution, Odisha.

INTRODUCTION

Madhuca latifolia (Mahua) is an important non-timber forest products (NTFPs) species in Central and Eastern India as it is linked to the tribal livelihood systems in different ways. Mahua seeds and flowers that are of particular importance are collected by the tribes for self-consumption and for sale to generate income to purchase daily household needs. However, it is imperative to clearly understand how Mahua has been contributing to the socio-economic domains and rural livelihoods of these communities and besides, to understand the linkages between various socio-economic factors (location, wealth status, gender, education and seasonality) affecting the level of dependency on Mahua with particular reference to flower and seeds in different districts/ agroecological zones of Odisha. The objectives of this paper was to analyze the contribution of Mahua to the household economies of the forest dwellers in the state of Odisha.

MATERIALS AND METHODS

The study was conducted in 10 different provinces

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Table 1. Family size of sample rural population dependant on *Madhuca latifolia.*

Province/ District	Average no. of members family	Average no. of males/ family	Average no. of females family	Average no.of children/ family	Proportion of household (%) Family size small (up to 4)	Family size medium (up to 5—8)	Family size large (>8)
Sundargarh	6.2	2.2	2.2	1.8	70.00	20.00	10.00
Mayurbhanj	5.6	2.0	1.8	1.8	27.50	60.00	12.50
Baleswar	5.7	1.8	2.0	1.9	17.50	75.00	7.50
Nayagarh	4.7	1.8	1.7	1.2	50.00	40.00	10.00
Kandhamala	5.6	1.9	1.7	2.0	25.00	65.00	10.00
Nabarangpur	4.7	1.8	1.5	1.4	60.00	35.00	5.00
Koraput	6.6	2.2	2.0	2.4	7.50	87.50	5.00
Nuapada	5.5	1.8	1.9	1.8	22.50	75.00	2.50
Bolangir	6.6	2.3	2.0	2.3	12.50	75.00	12.50
Angul	6.5	2.2	2.3	2.0	30.00	52.50	17.50

of Odisha (Sundargarh, Mayurbhanj, Baleswar, Nayagarh, Kandhamal, Nabarangpur, Koraput, Malkangiri, Nuapada, Bolangir and Angul) involving 40 households in each province using a pre-tested sample questionnaire which involved two parts, the first part contained the socio-economic attributes of the villagers and the second part on the frequency of Mahua flower and seed collection and income generation to the household during April 2017 to June 2017.

RESULTS AND DISCUSSION

Socio-economic status of mahua dependant forest dwellers

The average number of members per household ranges in the studied province ranged from 4.7 (Nayagarh) to 6.6 (Bolangir). The number of adult males/family ranged from 1.8 (in Bolangir, Nuapada and Nabarangpur) to 2.3 per household in Bolangir while the number of adult female per household was maximum in Angul while lowest in Nabarangpur. It was found that the large family size (more than 8 members) were found in Angul (17.5%) while very few (2.5%) were found in Nuapada (Table 1). The number of trees owned by the households ranged from 4.5 in Nabarangpur to as high as7.3 in Koraput (Table 2). The period of Mahua flower and fruit collection invariably remained same in all the provinces from March 3rd week to April 3rd week for flower and from 1st week of June to the 4th week of June spanning one month period for each activity.

Collection and contribution of *Madhuca latifolia* to the annual income

Analyzing the respondents of villages dependant on Mahua the average annual income from agricultural produce varies from Rs10, 622 —Rs 76,636 among all the provinces with maximum in Bolangir and minimum in Mayurbhanj. The annual income from wages found highest (Rs 35,452) in Koraput and lowest (Rs 6,500) in Nayagarh. The annual income from 'NTFPs other than Mahua' was found highest (Rs 5,412) in Koraput and lowest (Rs 1,072) in Bolangir. The annual income from flowers and

Table 2. Status, collection and utilization of *Madhuca latifolia* and its produces in sample villages of different provinces of Odisha.

Province	No. of trees/ HH	Collection of Mahua flower/ HH (Qtls)	Mahua flowers selling price (@ Rs/ kg)	Collection of Mahua seeds/ HH (kg)	Oil extracted from seed/ HH (liter)
Sundargarh	8.9	4.36	29.00	71.00	28.80
Mayurbhanj	7.9	3.64	23.66	59.92	24.17
Baleswar	7.3	2.58	25.20	31.26	13.50
Nayagarh	6.0	3.33	24.17	93.33	32.92
Kandhamala	5.9	2.30	24.05	56.16	24.42
Nabarangpur	4.5	2.74	23.74	39.04	15.35
Koraput	7.3	3.76	23.17	38.23	14.70
Nuapada	5.4	2.76	24.28	41.96	18.43
Bolangir	6.6	7.07	22.60	327.4	129.12
Angul	9.0	4.11	25.00	71.47	26.59
Mean	6.88	3.67	24.49	82.98	32.80

seed oil of Mahua was found highest (Rs 22,306) in Bolangir and lowest (Rs7, 631) in Baleswar (Table 3). Analyzing the contribution of Mahua products to the total income gnerated from NTFPs it was found that maximum contribution was found incase of Bolangir (95.49%) and minimum contribution in case of Nuapada (60.23%). Similarly, contribution of Mahua products to the total income generated from all sources was found maximum (21.94%) in Sundargarh and minimum (14.12%) in Baleswar (Table 3).

Dependence on mahua across the people of different socio-economic strata

Mahua tree nevertheless is the most sacred tree among the tribes of Odisha. The various parts of the plants are used as NTFPs. The dried flowers are roasted, made into balls or laddus and are often used as snack, besides, the dried flowers are roasted with sesame and other wild seeds and used for household consumption. The households, irrespective of their land holding size and/economic status, have been depending on this species for various use from cultural to meeting economic or family household needs. All the households in the study sites consume the flower as vegetables and Mahua has been particularly important in providing critical subsistence during the lean seasons for mostly the disadvantageous and low land-holding families. Besides, Mahua provides livelihood to all households who collect it for self-consumption and for sale and the income of which is used to buy household needs. Studies conducted in other parts of India such as Bihar, Madhya Pradesh and Andhra Pradesh show that the contribution of NTFPs to total household income range from 10-55% and about 80% of forest dwellers depend on forests for 25 to 50% of their food requirements (Pandey et al. 2016). Most of the NTFPs are collected and used/sold by women, so it has a strong linkage to women's financial empowerment in the forest-fringe areas. Several other studies have shown high dependence of forest dwellers on a wide variety of NTFPs. For example, Saha and Sundriyal (2011), Lalremruata et al. (2006) reported NTFPs in the humid tropics of North-East India contributed to 19.32% of the total household income for different communities, Sahoo et al. (2010a,b,c) assessed the degree of NTFPs dependency by the tribes of Mizoram which reveal that NTFPs collection is a source of income for the forest dwellers in the state. There have been some studies which clearly distinguish NTFPs dependency among the landless and land owners. Poverty and fuelwood usage were the factors for land owners while rice insufficiency, off-farm income and fuelwood usage mostly affect the NTFPs dependency for landless people.

Table 3. Contribution of *Madhuca latifolia* to the total income (Rs) household/ annum.

Agroclimatic zone	Income from agricultural produce A	Income from wages B	Income from NTFPs other than Mahua C	Income from Mahua flower D	Market value Mahua seed oil E	Income from Mahua tree products F (D+E)	Income from NTFP's (Rs) G (C+ F)	Total income H (A+B+G)	Contribution of Mahua products to income from NTFPs (%)	Contribution of Mahua products to total income (%)
Sundargarh	16070	28980	4540	12497	1440	13937	18477	63527	75.43	21.94
Mayurbhanj	10622	28400	1130	9090	1188	10278	11408	50430	90.09	20.38
Baleswar	14378	27333	4716	6956	675	7631	12347	54059	61.80	14.12
Nayagarh	49320	6500	1850	8166	2062	10229	12079	67899	84.68	15.07
Kandhamala	18500	18356	4230	7650	845	8525	12725	49581	66.99	17.19
Nabarangpur	18548	22133	4737	7025	767	7793	12530	53212	62.19	14.65
Koraput	13608	35452	5412	8688	735	9423	14517	63579	64.91	14.82
Nuapada	21810	13384	5151	6882	921	7803	12955	47194	60.23	16.53
Bolangir	76636	15968	1072	16818	5488	22306	23378	115982	95.41	19.23
Angul	51857	16329	1247	10294	1329	11623	12870	81057	90.31	14.34

Extent of mahua and other NTFPs contribution to the economies of the households

Occupation pattern of the studied sites showed that paddy is the major crop. Maize, millet, groundnut and vegetables too are also grown in a varying degree by the tribes/ forest fringe dwellers. However, the hilly terrain does not favor better paddy growth and it was observed the households having limited acres of land using for paddy cultivation with very low productivity. The engagement of tribal in agricultural practices reveals that the months of June to Oct is the busiest month as all the farming operations are done in this period. During the agricultural stress period and non-farming months, the dependence on NTFPs increases and during this period, more collection of forest produce takes place. Studies conducted in elsewhere and in India suggest that the rate of extraction of NTFPs is linked to the degree of agricultural stress (Thomas et al. 2011, Delacote 2007). Several studies have also revealed that NTFPs/forest dependence with increase off-farm or non-forest income. Higher agricultural productivity and agriculture income results in less extraction of forest resources (Guntilake 1998, Momo et al. 2006, Rayamajhi et al. 2012). Since NTFPs have a ready and accessible local market, income from NTFPs helps compensate for lean harvests. Moreover, the typical flowering season of many of the major NTFPs coincides with the agricultural post-harvest period in March. Thus the quantum of agricultural harvest determines the level of NTFPs extraction from the forest. The income contribution of Mahua to the total NTFPs income per household is substantial (60% in Nuapada to >90% in Bolangir) which confer the substantial role of Mahua in the livelihood of the forest dwellers compared to other NTFPs. The income from Mahua varies from Rs 7,631 to 22, 306 per household, this requires 15-20 days of hard work during the flowering season. In a season each household collects about 2.30-7.07 quintal of Mahua flower per household, which contributes to 14.12% of the total family income (in Baleswar) and 21.94% of the total family income in Sundargarh (Table 3).

CONCLUSION

Mahua tree is an integral part of the livelihoods of the tribes and it is most critical and principal suppliers for livelihood. However, there is limited marketing and use of the Mahua products. Widening the scope of Mahua flowers marketing, diversifying the use of Mahua flowers and seeds, creating important infrastructures for processing of Mahua flowers, capacity building of Mahua flower and seed collectors and planting of high yielding Mahua trees are some of the suggestive measures which may be undertaken to boost the rural economy especially for the forest dwellers in the state of Odisha.

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