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RESEARCH ARTICLE

Livelihood Dependency of Garasia tribes utilizing Non Timber Forest Products in Abu Road area of Sirohi district in Rajasthan, India.

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Abstract

Abu road block of Sirohi district in Rajasthan, India lies in 24.4641° N, 72.7718° E. A study was undertaken in tribal belt of Sirohi district in Rajasthan (India) to assess the livelihood dependency of Garasia tribes living in 24 villages in Abu road block. The area has also been notified as Scheduled tribe vide Ministry of tribal affairs, Govt. of India. Findings of reconnaissance survey reveals that livelihood systems in the study area are complex, primarily dependent on primitive mode of agriculture, followed by daily labour and NTFP (Non Timber Forest Products) collection and selling as their source of livelihood. On the basis of maximum collection qualitatively (through pre-tested and structured questionnaire) identified key NTFPs are *Jatropha curcas* (seeds) and *Diospyros melanoxylon* (fruits) collected in 83% villages, *Momordica dioica* (fruits) and *Phoenix* (fruits) collected in 67% and 50% villages respectively. The quantified key NTFPs with their (mean± S.D.) collection /annum in kg are: *Tamarindus indica* : fruits (49.25±46.04), *Pithecellobium dulce* : fruits (36.12±18.36) Rs.10-15/kg, *Momordica dioica*:fruits (29.31± 15.68), *Annona squamosa*: fruits (14.20±12.77), *Diospyros melanoxylon* : fruits (14.08±11.81), *Syzygium cummuni* : fruits (13.48±11.32), *Pongamia pinnata*:seeds (13.18±11.53), *Phoenix sp.* : fruits : (12.37±11.38) and *Jatropha curcus* : seeds (10.14 ± 8.84). The findings of the present studies reveals that although there is high resource availability in the study area but due lack of awareness, scientific knowledge about various post harvest and value addition methods with inadequate marketing channels and facilities, the income from the key NTFPs are very low. NTFP collection in the area is a year round activity but tribal depends on it to sustain their livelihood needs instead of adopting it as an income generating activity.

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Introduction:-

Non-wood forest products (NWFPs) are goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests. Non-timber forest products (NTFPs), another term frequently used to cover this vast array of animal and plant products, also include small wood and fuelwood. In India over 50 million people are dependent on NTFPs for their subsistence and cash income (Maithani, 1994; Hegde et al., 1996; Tejaswi, 2008). Around 50% of forest revenues and 70% of forest based export income of the country comes from NTFPs. Thus it can be depicted that NTFPs form one of the mainstays of income and sustenance for many tribal communities (Rao, 1987; Gauraha, 1992; Chopra, 1993; Mallik, 2000). Based on these facts a study is being conducted (2012-2017) in tribal dominated area of Abu Road block of Sirohi district in Rajasthan.

Objectives of the study:-

- ❖ To document the extent of NTFP collection, processing and storage methods practiced in selected villages.
- ❖ To study extent of NTFP trade and identify the gaps from NTFP collector to the market level in selected villages.
- ❖ To explore the potential of key NTFPs through introduction of low cost post harvest management practices and their value addition.
- ❖ To enhance the productivity of agriculture land by induction of trees in the production system.

Materials and Methods:-**Background study:-**

A preliminary survey was conducted to gather information on geographic area of villages, occupation pattern and socio-economic status of households. The interaction was held with State Forest Department, Sirohi, Zila Parishad and District Statistical Officer, Sirohi and Revenue Department, Abu Road. Similarly Key informant interviews were conducted with selected community leaders, traders and collectors at various study sites. To assess the role of NTFPs in the tribal livelihood, 25 % villages were selected randomly for detailed socio-economic and 10% families in each study village was surveyed. In less populated villages minimum 40 households were surveyed.

Questionnaire survey:-

A questionnaire survey was conducted to collect information on following issues: a) NTFPs collected, their parts used and their end use, b) quantity of NTFP gathered per physical trip and quantity collected in a season. Secondary data were collected from State Forest Department, Sirohi, Zila Parishad and District Statistical Officer, Sirohi and Revenue Department, Abu Road. Quantitative data was analyzed using SPSS where as qualitative data through coding and memoing (Punch, 2005). Results were analyzed for livelihood approach through strategic intervention for further implication.

Result and Discussion:-**Socio-economic Survey:-**

Data on land use pattern are summarized in Table-1.

Table-1:- Land use pattern.

Particulars	Sirohi District	Abu Road Block
Total area (Ha)	517947	85811
Forest (Ha)	155461	55563
Irrigated (Ha)	76270	4546
Un-irrigated (Ha)	70172	12656
Cultivable waste (Ha)	26054	2915
Not available for cultivation (Ha)	72049	10131
Population (2011)	8,51,107	1,84,610 (1,19,996*)
Livestock (2007)	1028438	59538 **

* Tribal Population of Abu Road Block

** Cattle population of 24 villages

(Secondary Data, Source: DSO, Sirohi)

Results of socio-economic survey are summarized in Table-2 and table-3 as under-

Table-2:- Socio-economic Characteristics of the sampled households:

S. No.	Socio-economic Characteristics	
1	Average family size	5
a	Av. No. of males involved in NTFP collection	2
b	Av. No. of females involved in NTFP collection	3
2	Average land holding (Beegha)	2.0
3	Av. Cattle Population (2007)/household	10

(Source: Primary Data)

Table-3 : Sources of income in average year of Rainfall

Source of income	Average Asset Size	Details	Amount (Rs.)	% of people having the resource	Average contribution to HH income in Rs.
Agriculture	2 Beegha	Maize 1.5-2 quintal @ 1200/- p. quintal	1800-2400	60%	1260
		Wheat 1.5-2 Qt. @ 1400/- per quintal	2100-2800		1470
		Tuar/Chanwla/Chana/other cash crop 1-2 quintal @ 3850/- p.quintal	3200-6400		5775
Animal Husbandry	2 cows/ 2 buffaloes, 4 goats, 2 oxen	Milk 1-1.5 lit. Per day for 150 days. @ Rs. 20 per litre	3000-4500	40%	1500
	Selling of birds and animals	Selling of hens, eggs, goats, cows, sheep etc.	1500-2000	50 %	875
NTFPs	Tendu Patta	Tendu Patta collection 500-1000	500-1000	100%	750
	Other NTFP	<i>Momordica dioica</i> , <i>Annona squamosa</i> , <i>Phoenix spp.</i> , <i>Jatropha curcas</i> etc.	1500-3000	90 %	2750
Daily Labour	Minimum50-80 days per year	50-80 days@Rs. 150/-	7500-12000	60%	5850
Total Average Income (Rs.)					20, 230/-

(Source: Primary Data)

Discussion of Socio-economic status of tribals:

- ❖ The study area constitutes 85% tribal population comprising mainly Garasia, Gameti (Bhil) and Meena. Most of them belong to BPL category. (Annexure-I)
- ❖ The socio-economic survey of this area reveals that economically tribal people are very poor residing in the interior parts of the forest and depend on it as their main source of livelihood. The forestland consists of 65% of the total area with only 6 % land being under cultivation.
- ❖ Jan Chetna Sansthan, Doosra Dashak and Pradan are NGOs visiting the study area and are working mainly in the field of tribal rights, education, microfinance and agriculture respectively.
- ❖ Agriculture and daily labour are the major source of livelihood. People in the area work as daily labourer but also visit to Abu Road, Koteshwer, Ambaji etc. in absence of the labour opportunity in nearby villages.
- ❖ Animal husbandry is also one of the important source of livelihood. Every family has one or two cows/buffaloes and 5-10 goats but the milk production from cows is as low as 1-1.5 litres per day.
- ❖ People usually do not sell milk and they use it for household consumption. However, the sale of goat and poultry fetches some money (about 1500- 2000) every year.
- ❖ Women equally share the economy of a household and in some instances earns up to 75% of the income.
- ❖ Friends and relatives, Village Money lender, Banks and co-operatives are the sources for availing credit by the households at the time of the need of credit.
- ❖ Fuelwood is the only source of cooking and is being extracted from nearby forest. On an average household collection ranges from 1500-2500 Kg annually.
- ❖ *Zea mays* (Maize), *Triticum aestivum* (Wheat), *Cajanus cajan* (Tuar), *Phaseolus vulgaris* (Chanwla/Lobia), *Cicer arietinum* (Chana/gram), Vegetables, *Ricinus Communis* (Arandi/castor), *Cyamopsis tetragonoloba* (Gawar), *Brassica juncea* (Raida), *Brassica campestris* (Mustard) are some of the important crops.
- ❖ Average family size is 5, average land holdings-2.00 beegha and Av. Cattle population per household is 10. The av. income of households ranges from Rs.20,000-25,000/- per annum.
- ❖ On average NTFPs contributes about 17% of the total income. However, the contribution ranges from 10-30% to different families.(Annexure-II, Graph-I)

- ❖ Traders play an important role in NTFP selling. Most of them are either local traders operating as middlemen simply collecting NTFP from village agents/shopkeepers and deliver in the township, or they have a full-fledged shop at the town.
- ❖ The two major seasonal spices in the area are tamarind and fennel. Tamarind is collected from wild in six villages on average 49.25 Kg per village per annum and accounts for 33% among the contribution of Key NTFPs to the total village economy. Cultivation of fennel is done in eight villages and contributes about Rs.4800/- per annum with 0.98 % of the total income. This low contribution accounts for primitive mode of agriculture practices and poor marketing knowledge and linkages.
- ❖ NTFP collection in 24 tribal dominated villages and their collection period are summarized in table-4-
- ❖ The identified key NTFPs playing significant role in tribal livelihood with their (mean± S.D.) collection /annum in Kg. are summarized in Table-5.

Table-4:- NTFP collection in 24 Villages

S. No.	NTFP and its part	No of villages in which NTFPs are collected	Collection Period
1	<i>Jatropha curcus</i> : Seeds	20	Throughout the year
2	<i>Diospyros melanoxylon</i> : Fruits	20	March-April
3	<i>Momordica dioica</i> : Fruits	16	August-September
4	<i>Phoenix sp.</i> Fruits	12	March-May
5	<i>Annona squamosa</i> : Fruits	10	Oct.-Dec.
6	<i>Syzygium cummuni</i> : Fruits	10	June -July.
7	<i>Pongamia pinnata</i> : Seeds	10	May-June
8	<i>Tamarindus indica</i> : Fruits	08	March-April
9	<i>Pithocellibium dulce</i> : Fruits	06	April-May

(Source: Primary Data)

Table-5:- Key NTFPs of study area on the basis of collection/annum (Six villages)

S. No.	NTFP and its part serving as a income source for tribals	Collection per annum in Kg (Mean± S.D.)	Prevailing market rate (Rs./Kg)
1	<i>Tamarindus indica</i> : fruits	(49.25 ± 46.04)	30-40
2	<i>Pithocellibium dulce</i> : fruits	(36.12 ± 18.36)	10-15
3	<i>Momordica dioica</i> : Fruits	(29.31± 15.68)	40-60
4	<i>Annona squamosa</i> : fruits	(14.20 ± 12.77)	15-30
5	<i>Diospyros melanoxylon</i> : Fruits	(14.08 ±11.81)	15-30
6	<i>Syzygium cummuni</i> : fruits	(13.48 ± 11.32)	30-40
7	<i>Pongamia pinnata</i> : seeds	(13.18 ± 11.53)	7-10
8	<i>Phoenix sp.</i> Fruits	(12 .37 ± 11.38)	10-20
9	<i>Jatropha curcus</i> : Seeds	(10.14 ± 8.84)	10-15

(Source: Primary Data, Annexure-II, Graph-II)

Market Price Spread Studies:-

Visited 12 traders dealing with marketing of NTFPs in study area and collected information on from collector to processor level through structured questionnaire. Results indicate that traders play an important role in NTFP selling. Most of them are either local traders operating as middlemen simply collecting NTFP from village agents/shopkeepers and deliver in the township, or they have a full-fledged shop at the town.

Discussion on Market studies and Identified Key issues:-

The identified key issues in Collection and marketing of NTFPs include:

1. NTFP collection at village level is not organized and barter system also exists in the villages. Collected NTFPs are sold at minimum/very low rate to the village agent i.e. mostly owner of Grocery shop from where they get the items for their day to day use.
2. The price of NTFPs is most often determined by the traders – depending on the margin they need. It is not based on demand/supply.
3. As the supply base is limited and seasonal, the traders often do not give the real price. In the bargain the primary harvester/collector is getting poor returns compared to the real value of the produce.

4. Like agriculture, NTFP collection and supply is also dependent on rain. In good rainfall years, tribals are engaged in agriculture work, therefore, collection and supply of NTFP is very less. Accordingly, prices of the collected NTFPs are high under such circumstances and vice-versa.
5. A tribal Co-operative society i.e. Abu road Kray-Vikray Sahakari Samiti is functional in Abu Road for purchasing of NTFPs, but due to poor transportation facilities and lack of communication systems tribals sell their products mostly in the village.
6. Secondly, the prices offered by the Co-operative are very less, therefore, village agents prefer to sell their products in nearby markets at Khed Brahma, Koteshwer and Ambaji.
7. Tribals are not aware with the proper collection, harvesting and post-harvest management practices. For collection of gum, damage to *Butea monosperma* (Palash), *Boswellia serrata* (Salar) and *Anogeissus latifolia* (Dhawra) was observed in some study villages.
8. Similarly, Mahua flowers are hand - picked from the forest floor, which is sometimes bushy and inaccessible. Therefore, for convenience of collection, the forest floors are set on fire and the white flowers are clearly visible and picked up.
9. Drying of Mahua flowers is also done under unhygienic conditions and the dried flowers retain some moisture so that the quality of the whole collection deteriorates. Almost 50% of mahua flowers are spoiled due to lack of proper storage facilities. In rainy season Mahua flowers absorb moisture and begin to deteriorate very rapidly.
10. The collectors not getting fair prices due to lack of unscientific methods of weighing at the harvesters/local market/local traders level. NTFPs like *Momordica dioica* (fruits), *Diospyros melanoxylon* (fruits), *Butea monosperma* (flowers), *Annona squamosa* (fruits), *Feronia limonia* (fruits) etc. are sold by school children in poly bags priced as Rs. 10-20/- per poly bag.
11. NTFPs collected from rare /endangered / threatened species are also (banned items) traded freely in the market and even billed in different names.
12. NTFP trade is generally based on information. Knowledge about production, valuation, processing, marketing channels are usually based on guess. For example, it was very difficult for us to get, a reliable figure on the production and sale value of Mahua and Palash flowers along with a breakup of its villagewise consumption and quantum of amount collected by various dealing /traders agencies across the supply chain.
13. There is a lack of scientific quality parameters or standards. Traders go by physical characteristics giving scope for reducing prices arbitrarily.
14. Some adulterants are also traded freely in the market e.g. gum from *Boswellia serrata* (Sali gugul) is freely traded in Ambaji market in place of original guggul gum.
15. For export of various NTFPs there is no inspection, verification, testing and certification unit in Rajasthan. There is a single certification Agency i.e. SGS (Société Générale de Surveillance) with its offices at Ahmedabad, Chennai, Mumbai, Bangalore, Orissa etc.

Conclusions and Recommendations/ intervention for improving tribal livelihood:-

Recommendations/ intervention to ensure good returns from NTFPs include-

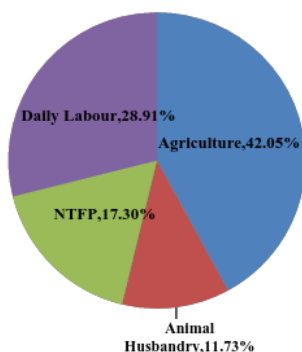
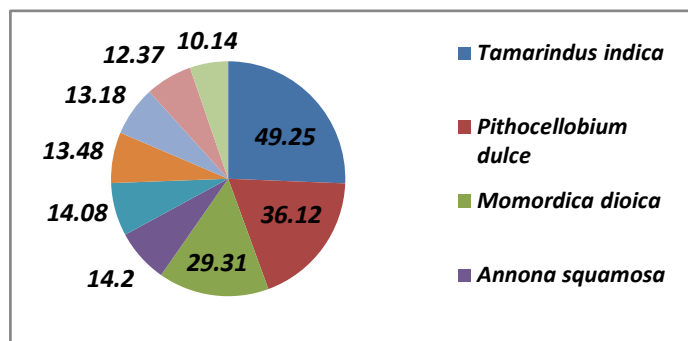
1. NTFP Collection Centers with adequate storage facilities should be established for collection weighing and storage of NTFPs.
2. Collection, processing, and marketing continue to operate in a traditional way in most of the study villages. Therefore, introduction of good collection and harvesting methods through Village Forest Protection Committees/SHGs and promoting group marketing approach etc. will ensure non destructive harvesting of NTFPs.
3. Linking VFPC/ SHG with user industries/trading bodies for direct selling their value added products will enable tribals to get good return of their products.
4. Linking VFPCs/SHGs to banks with provision of revolving funds will be helpful in NTFP marketing and trade.
5. There should be a clear cut policy regarding export of NTFPs in India and abroad.
6. There is no governing body for NTFP market watch. Like APMC, a governing body should be constituted for NTFP to fix minimum support price for non-nationalized NTFPs and to keep strict vigilance on NTFP cash flow.
7. Credible product certification regimes, updated market information and availability of data for demand and supply of NTFPs at each collection centre including at the national level also will ensure better return to the tribals.

Hence, based on above facts it is suggested that introduction of good collection and harvesting practices, imparting trainings for post-harvest methods to tribals, establishment of governing body for NTFP market watch, establishment of collection centers well equipped with storage and drying facilities at village level, linking Village Forest Protection Committee to income generating activities as well as direct to the marketing channels will definitely ensure a good return to the tribal community. Besides, NTFP collection should be based on participatory approach both for planning and management.

Annexure-I:-

Caste composition of study villages-

S.No.	Name of Villages	Coordinates	Total No. of Households	Tribal Households
1	Jamboori	N =24°23.621' E =072°55.151'	375	373 (Garasia)
2	Siyawa	N =24°25.654' E =072°46.309'	795	779 (Garasia)
3	Soorpagla	N =24°23.200' E =072°49.538'	610	549 (Garasia)
4	Meen	N =24°23.456' E =072°53.173'	370	370 (Garasia)
5	Taleti	N =24°23.528' E =072°47.183'	341	321 (Garasia)
6	Bosa	N =24°22.016' E =072°57.441'	211	211 (Gameti-Bheel)
7	Deri	N =24°22.200' E =072°49.538'	340	340 (Garasia)
8	Uplakhejra	N =24°27.566' E =072°56.506'	153	153 (Garasia)
9	Nichlakhejra	N =24 27.754 · E =072 54.982	235	235(Garasia)
10	Uplagarh	N =24 26.578 · E =072 52.638	494	493 (Garasia)
11	Nichlagarh	N =24 28.556 · E =072 53.214	572	94(Garasia)
12	Ranora	N =24 25.943 · E =072 57.793	176	176 (Garasia)
13	Rada	N =24 25.092 · E =072 53.060	82	81 (Garasia)
14	Doyatara	N =24 30.184 · E =072 57.791	515	514 (Gameti-Bheel)
15	Jayadra	N =24 29.499 · E =072 53.949	177	175 (Garasia)
16	Booja	N =24 25.483 · E =072 54.978	156	156 (Garasia)
17	Paba	N =24 28.693 · E =072 59.025	322	322 (Garasia)
18	Boribooj	N =24°30.867' E =072°59.643'	390	390 (Garasia)
19	Derna	N =24°30.675' E =072°50.178'	198	80 (Gameti -Bheel)
20	Tankiya	N =24°31.406' E =072°55.302'	185	185 (Gameti-Bheel)
21	Jawai	N= 25°13.033' E=073° 09. 74'	147	147 (Gameti Bheel)
22	Uplibor	N =24°27.160' E =072°53.406'	152	152 (Garasia)
23	Chhapari	N =24°22.416' E =072°48.395'	70	68 (Garasia)
24	Nichli Bor	N =24°26.150' E =072°53.396'	97	97 (Garasia)

Annexure-II, Graph-I**Graph-I:-** Contribution of NTFPs in tribal area of Sirohi district in Rajasthan**Graph II:-** Contribution of NTFPs per family per annum in kg in tribal area of Sirohi district in Rajasthan**Acknowledgement:-**

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