RESEARCH ARTICLE

LIVELIHOOD POTENTIAL AND ECONOMIC STATUS OF NON-TIMBER FOREST PRODUCE (NTFP) IN SABARKANTHA DIVISION OF GUJARAT

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Manuscript Info	*Abstract*
……………………. 	……………………………………………………………… Non-timber forest products (NTFP) will constitutes the largest determinant of livelihood for communities and the poor surrounding the forests. In India, many tribal communities live in and nearby forest and there daily activities are dependent directly or indirectly on forest resources. Such human dependency on forest for livelihood leads to certainly ecological loss and this Ecological loss must be compensated to ecological gain by sustainable management of forest resources. To examine the dependence of forest communities on NTFPs twelve sites in North Gujarat had been studied. Under this study, 65 villages were surveyed. In each village 10 to 20% sample house holds were surveyed which was extrapolated to 100% for final result. For this survey, nine major types of NTFPs were taken into account and Economic value for each product was studied separately. Some of the NTFPs like gum, leaves and flowers of Anogeissus latifolia (Roxb.) Wall. ex Bedd., Acacia nilotica (L.) Del., Madhuca indica J. F. Gmel., Diospyros melanoxylon Roxb. Etc. Total income from these villages from above NTFPs is 1.002 crores and when sampling was extrapolated to 100% the income after selling is approx. 8.66 crores.

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Introduction:-

Forest resources provide ample goods and services ranging from timber and non-timber products. These products serve as the sources of livelihood and food security for the dwellers living within and around forest reserves area of developing countries (Aluko et. al. 2020). People living in forest depend directly or indirectly on forests and on forest products for their livelihoods, more over it is predicted that the rapid act of deforestation will soon lead to forest people into utter destitution. The famous motto is to "save the forest" has recently evolved into "save the forest people" or "save the forest for the forest people" (Patrice et.al. 2005). Since the early 1990s, much effort has been put into the development of non-timber forest products as 'the' solution for saving forests and forest people via extractive reserves, marketing of natural products, etc.(Peters et al., 1989; Anderson, 1990; Nepstad and Schwartzman, 1992; Ruiz Perez and Arnold, 1996). Here the NTFPs refers to medicinal plants, food, gum, resin, fibre and others kinds of non timber products collected from the forest (Peters et. al., 1989, Chamberlain et. al., 1998). Collection of non timber forest products from local nearby forest for getting cash income or used by indigenous people for their survival and livelihood can be noticed since thousands of year ago (Ticktin 2004, Freed 2001). Collection of NTFPs is not only a key issue to improve the living standards but also related to conservation of biodiversity of indigenous species and sustainable development of the regions (Kareiva 1994, Gould et. al., 1998,

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Baird and Fearden 2003). Traditional market is a major site for indigenous people for getting cash income but also a major site for exchange of traditional knowledge on plant use and conservation of biodiversity (Williams's et. al., 2000, Mertz et. al., 2001). In our survey sixty five villages of Sabarkantha were studied all above terminology fulfilled in utilizing the Forest Produce by the villagers in Sabarkantha District.

Materials and Methods:-

The study was conducted in Sixty five villages of Sabarkantha district of Gujarat- India. The villages were selected randomly from each working circle allocated while preparations of working plan, 2012. Total 65 villages were selected and out of which each village ten percent of sample house holds were surveyed. The method adopted for collection of information was the interviews with tribal people and local traders. During the survey background information of the NTFPs peddlers and consumers was also gathered. Ten percent of households from each community in the village were randomly selected and interviewed with the help of semi-structured questionnaire designed CF W.P. The questionnaire was filled up on the basis of the information obtained from the villagers. According to the information obtained from the survey, the specimen of the utilized plant as various resources is collected from the forest area with help of local people and identified by local name and scientific name. After the survey the data was divided into different groups for example collection, self consumption, marketing etc and the result were extrapolated to hundred percent.

Table and Figure:

Table 1:- List of some important plant species used as NTFP in Sabarkantha.

Sr. No.	Local Name	Botanical Name	Family	Part Used as MFP/ NTF
1	Mahuda	Madhuca indica J. F. Gmel.	Sapotaceae	Flowers, Seeds
2	Timru	Diospyros melanoxylon Roxb.	Ebenaceae	Leaves
3	Dhavdo	Anogeissus latifolia (Roxb.) Wall.ex.Bedd.	Combretaceae	Gum/Gundh
4	Khakhar	Butea monosperma Roxb.ex.Willd	Papilionaceae	Leaves
5	Musli	Chlorophytum borivilianum Sant. & Fernand.	Lilliaceae	Rhizome
6	Bawal	Acacia nilotica (L.) Del.	Mimosaceae	Gum/Gundh
7	Gugal	Commphiphore weightii (Arn)Bhandari	Burseraceae	Gum/Gundh
8	Salai	Bosewellia serralta Roxb	Burseraceae	Gum/Gundh

Table 2:- Densities of NTFP species.

SR. NO.	LOCAL NAME	BOTANICAL NAME	DENSITY
1	Mahudo	Madhuca indica J. F. Gmel.	1.835
2	Timru	Diospyros melanoxylon Roxb.	315.465
3	Dhavdo	Anogeissus latifolia (Roxb.) Wall.ex.Bedd.	234.955
4	Khakhar	Butea monosperma Roxb.ex.Willd	159.365
6	Bawal	Acacia nilotica (L.) Del.	2.535
8	Gugal/ Salai	Bosewellia serralta Roxb	14.005
Total			**728.16**

Table 3:- Total Collection, Self Consumption, Selling and Income from different N.T.F.Ps.

Sr. No.	N.T.F.Ps.	Total Collection (Kg./Pudies)	Consumption (Kg./Pudies)	Selling (Kg./Pudies)	Income of Consumption (Rs.)	Income of Selling (Rs.)	Total Income (Rs.)
1	Bawal Gundh	1445	35	1410	7000	353100	360100
3	Dhavdo Gundh	6582.2	655.25	5926.95	194025	1758047	1952072
4	Gugal Gundh	577.2	22.5	554.7	7875	119430	127305
5	Bee's Honey	1384.8	1384.8	0	220376	0	220376
6	Khakhara leaves *	700	0	700	0	7000	7000

7	Mahuda flower	51007.2	12333.9	38673.3	231622.5	933497.5	1165120
8	Mahuda Seed	15297.7	2042	13255.7	48530	349717.5	398247.5
9	Musli	508	20	488	30000	777000	807000
10	Timru leaves *	8042675	371100	7671575	228040	4758915	4986955
Total		8120177.1	387593.45	7732583.65	967468.5	9056707	10024175.5
* One pudi means 40-50 leaves (bundles of 40-50 leaves)							

Table 4:- Range wise Total Collection, Self Consumption, Selling and Income from different N.T.F.Ps.

Sr. No.	Ranges	N.T.F.Ps.	Total Collection Kg./Pudi	Consumption Kg./Pudi	Selling Kg./Pudi	Income of Consumption (Rs.)	Income of Selling (Rs.)	Total income (Rs.)
1	Bhiloda	Bawal Gundh	1.5	0	1.5	0	1200	1203
		Dhav Gundh	35.75	0.3	35.45	3750	128660	132481.5
		Honey	35	35	0	103500	0	103570
		Mahuda flower	907	206	701	160370	589245	751429
		Mahuda Seed	190	47	143	21370	70230	91980
		Musli	0.5	0	0.5	0	45000	45001
		Timru leaves *	70970	425	70545	780	746616	889336
2	Dholvani	Dhav Gundh	22.1	0	22.1	0	52516	52560.2
		Gugal Gundh	17.5	1.5	16	7875	85400	93310
		Honey	10.7	10.7	0	9576	0	9597.4
		Mahuda flower	150	25	125	5625	28125	34050
		Mahuda Seed	200	20	180	1200	94800	96400
		Timru leaves *	27200	2015	25185	10272	166668	231340
3	Himatnagar	Dhav Gundh	2	2	0	76800	0	76804
		Timru leaves *	4400	213	4187	3918	76542	89260
4	Khedbrahma	Timru leaves *	3000	400	2600	13800	94200	114000
		Musli	30	2	28	30000	687000	717060
		Dhav Gundh	69	7	62	60300	707100	767538
		Bawal Gundh	21.5	2.5	19	7000	105000	112043
5	Malpur	Bawal Gundh	15.5	0	15.5	0	62700	62731
		Dhav Gundh	8.25	0	8.25	0	16520	16536.5
		Mahuda flower	95	27	68	14325	50925	65440
		Mahuda Seed	65	10	55	6525	28200	34855
		Timru leaves *	84830	2939	81891	74400	1386016	1630076
6	Meghraj	Timru leaves *	18350	1820	16530	112500	799746	948946
7	Modasa	Dhav Gundh	11.2	0	11.2	0	48725	48747.4
		Honey	0.7	0.7	0	7800	0	7801.4
		Mahuda flower	48	8.4	39.6	30027.5	143697.5	173821
		Mahuda Seed	18.5	2.5	16	16400	132600	149037
		Timru leaves *	14100	0	14100	0	253500	281700
8	Poshina	Dhav Gundh	48.3	4.5	43.8	39975	86745	126816.6
		Mahuda flower	30.5	5.5	25	825	375	1261
		Mahuda Seed	12.8	2.8	10	1672.5	4890	6588.1
9	Raigadh	Bawal Gundh	25	0	25	0	183000	183050

		Dhav Gundh	9.5	0	9.5	0	347981	348000
		Gugal Gundh	10.15	0	10.15	0	29590	29610.3
		Mahuda flower	1.3	1.3	0	455	0	457.6
		Mahuda Seed	0.6	0	0.6	0	510	511.2
		Timru leaves *	17585	515	17070	11290	500417	546877
10	Vadali	Timru leaves *	8020	0	8020	0	155490	171530
11	Shyamlaji	Dhav Gundh	123.5	7	116.5	13200	297400	310847
		Gugal Gundh	3.7	0	3.7	0	4440	4447.4
		Khakhara leaves *	200	0	200	0	7000	7400
		Mahuda flower	325	67	258	15515	54810	70975
		Mahuda Seed	40	2	38	622.5	11827.5	12530
		Timru leaves *	12700	0	12700	0	105900	131300
12	Vijaynagar	Bawal Gundh	1.5	0	1.5	0	1200	1203
		Dhav Gundh	32.7	0	32.7	0	72400	72465.4
		Honey	35	35	0	99500	0	99570
		Mahuda flower	245	16	229	4480	66320	71290
		Mahuda Seed	70	7	63	740	6660	7540
		Musli	0.5	0	0.5	0	45000	45001
		Timru leaves *	67600	425	67175	1080	473820	610100
Total			**331924.8**	**9307.7**	**322617**	**967468.5**	**9056707**	**10688025**
* One pudi means 40-50 leaves (bundles of 40-50 leaves)								

Table 5:- Range wise Total income after Selling (Cash Income) (Survey Data and Extrapolated Data).

| Sr. No.	Ranges	Total Villages in Range	No. of Villages Surveyed	Survey Data			Extrapolated Data
				Total income	Income Per Village	% Income of Range	Total Income for Range
1	Bhiloda	67	6	1580951	263491.8333	17.46	**17653952.83**
2	Dholvani	38	7	427509	61072.71429	4.72	**2320763.143**
3	Himmatnagar	25	3	76542	25514	0.85	**637850**
4	Khedbrahma	42	5	1593300	318660	17.59	**13383720**
5	Malpur	49	7	1544361	220623	17.05	**10810527**
6	Meghraj	74	4	799746	199936.5	8.83	**14795301**
7	Modasa	61	6	578522.5	96420.41667	6.39	**5881645.417**
8	Poshina	53	10	92010	9201	1.02	**487653**
9	Raigadh	28	4	1061498	265374.5	11.72	**7430486**
10	Shamlaji	57	5	481377.5	96275.5	5.32	**5487703.5**
11	Vadali	41	2	155490	77745	1.72	**3187545**
12	Vijaynagar	41	6	665400	110900	7.35	**4546900**
Total		**576**	**65**	**9056707**	**1745214.464**	**100**	**86624046.89**
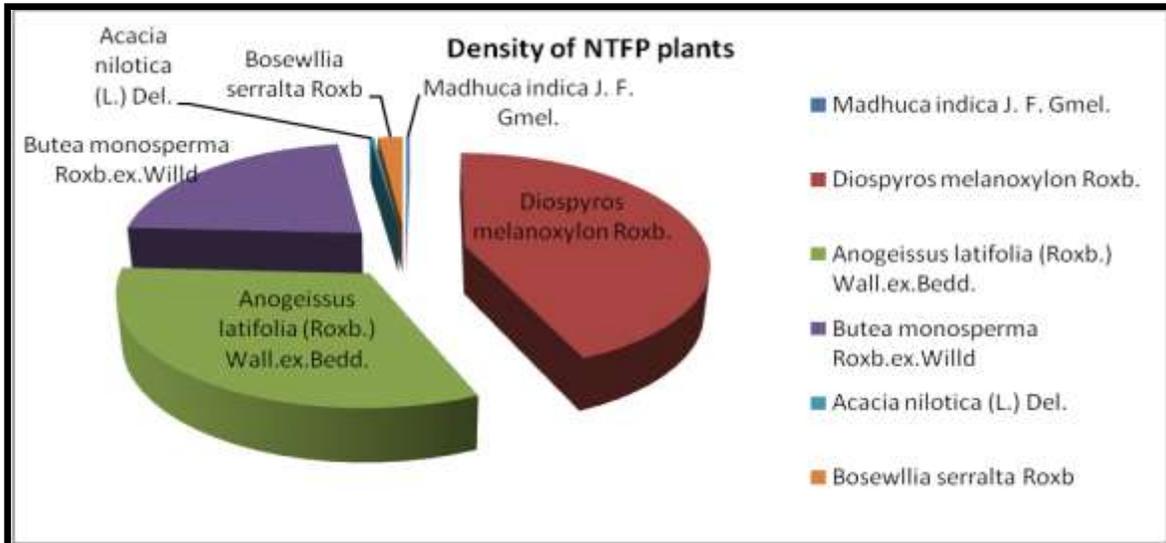
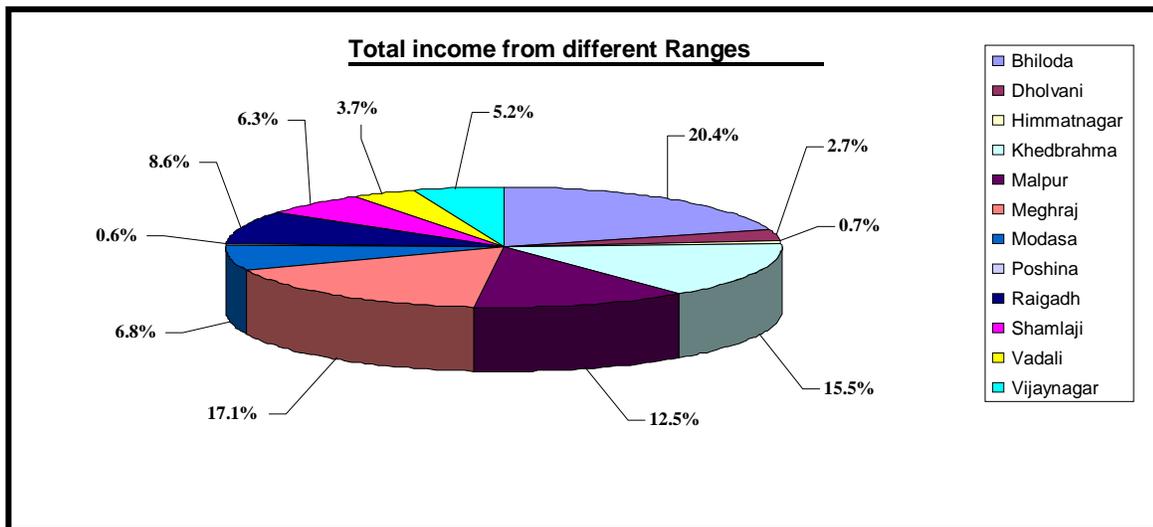**Fig 1:-** Density of NTFP plants.

Fig 2:- Total income from different ranges.
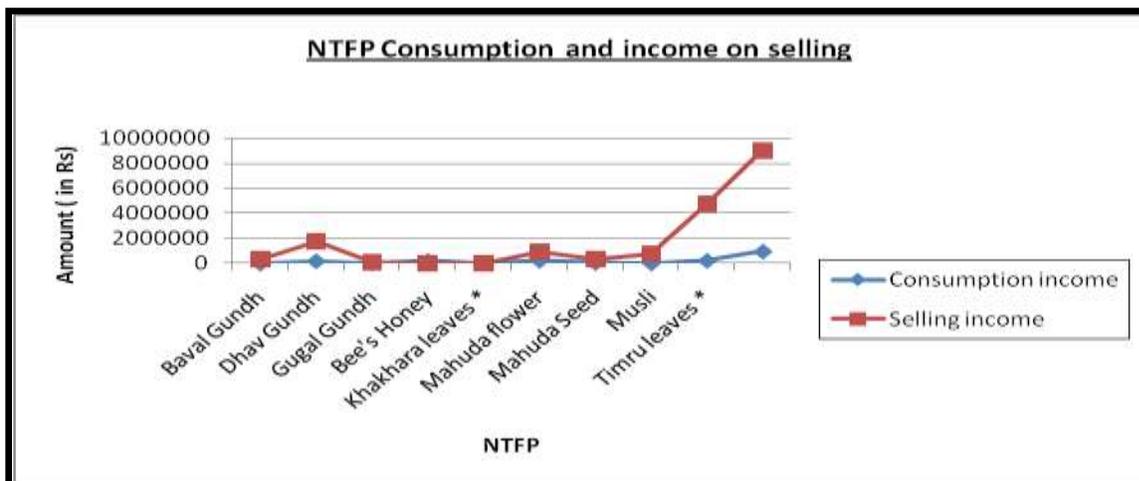

Fig 3:- NTFP consumption and income from their selling.

Result and Discussion:-

Density of NTFP Species:

Density is one of the indicator to evaluate impact of NTFP extraction (Silvertown,1982, Shahabudin & Prasad,2004, Abtew A.A., et.al.(2011),).It was calculated as the no of stems per hectare using total counts from all the plots in the given area. The Densities of commonly used NTFP are given in the table no. 1. Timru had maximum density followed by Dhavdo and Khakhar while species like Mahudo and Bawal had least densities. There exists a considerable variation in the pattern of distribution of NTFP species. There are two main reasons behind this viz human impacts and ecological conditions. Apart from these harvesting of NTFP (Van Dijk, 1999a) and commercial exploitation of timber also effect the distribution (Van Dijk, 1999). Species providing both timber and NTFP are eliminated more rapidly (Van Dijk, 1999a) like Mahuda.

NTFP market and collection:

The people residing inside forest and near forests in majority are preferred to collect the NTFPs having which are having high prices (value). They obtain good prices of the NTFPs from market and other traders. It was also observed that mostly the poor and unemployed people collect and sell the NTFPs in large quantities while some communities collect NTFPs for their personal use and consumption. Some poor communities retain large part of the produce for their own use and sell remaining part in the market. The income generated by the sale of NTFPs is utilized for buying their livelihoods and other necessary items. The collectors mostly recognize NTFPs by stem, leaves, and flowers or by smell and touch. According to collectors, nowadays, the NTFPs are not easily available in the forests. The collectable quantity of NTFPs is decreasing day by day i.e. disappearance of local natural species. Presence of NTFPs in forest is related to geographical location. In this survey nine major NTFPs were taken into consideration, which are available mostly in each forest. Out of theses NTFPs three were found to be dominant. These dominant forms are (1) Madhuca indica,(2) Diospyros melanoxylon (3) Butea monosperma. In some backward area the trading process is still keeping in a traditional style. There are a limited number of species collectors and sellers usually do not bother about accurate quantification. Quantity and trading wise each NTFPs varies (Table 3). From these NTFPs total income by the villagers is about 1.002 crores. 19.4%, 8.05% and 49.7% of income is from Dhavdo gum, Musli and Timru leaves. Due to industrialization collection of Khakhar leaves had depleted as these leaves are only used for traditional purposes such as marriage functions as leafy plates.

Collection and selling of different NTFPs depends on their utilization by peoples. Out of total collection of NTFPs about 95% is sold to traders for income. But in case of Mahuda out of total collection 24.1% flowers and 13.3% seeds are self consumed. Honey is collected only for self consumption (as per survey). When comparison was done between different ranges then people of Meghraj and Vadali only collects Timru leaves. In some ranges like Himmatnagar and Poshina people were mainly involved in collecting Dhav gum, Timru leaves and Mahuda's flowers and seeds. But in other ranges all nine types of NTFPs were collected. Among twelve ranges, income of Bhiloda was about 20.3% of total income while ranges like Poshina and Himmatnagar earn less then 1%. Communities near forests of Bhiloda are more involved in collection of NTFPs which have more market value such as Dhavda gum and Safed Musli. In the collection of these NTFPs mainly forest people or tribles were more involved. Hence sustainable management is necessary to maintain the status of the forest people and to conserve the diversity of the forests.

Conclusion:-

Density analysis suggests that there is lack of conservation of some species like Mahudo and Bawal. Forests are the main source of income in many parts of North Gujarat. Thus it proves from the study that forest dwellers are dependent on the forest for their requirement of MFP / NTFP and to improve their socio-economic condition and livelihood purpose.

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