

EXECUTIVE SUMMARY

Forests are nature's greatest gift to mankind. Since time immemorial human population has depended upon forest for its various needs, be it food, fodder, fibers, fertilizers, medicine, construction material etc.

With advent of synthetic age, the dependence on forest reduced to a great extent, paving way for synthetic materials. Forests became synonymous with "Timber Factory", a place to produce timber for its various commercial applications. In post world war II scenario, for many war devastated economies timber emerged as a main source of foreign exchange earning. As a result for almost three decades timber remained the main focus of forest development activities in total neglect to policies of conservation of natural resources and bio-diversity.

The threat to global climatic change due to fast eroding forest cover worldwide, led to increased environmental awareness which in turn led to redefining of the priorities for the development of the forest sector, where people's participation in forest conservation became the prime focus. In the changed system of things, which emphasized the need for non-destructive use of forest with greater avenues for primary and secondary occupation to village population residing in and around forest, the Minor Forest Produce became the focus of all development activities.

Along with it the incidents such as Thalidomide babies, the harmful effect of synthetic dyed clothes and ever increasing pollution of water bodies from effluent discharged from hosts of chemical and allied industries, changed the consumer perception towards synthetic material, in favor of natural products. This trend towards "Back to Nature" also rejuvenated worldwide interest in Minor Forest Produce and their systematic development.

The term Minor Forest Produce is a misnomer, because it indicates a secondary status to these groups of products in comparison to Timber, while in reality it is just opposite as MFP is the basis for multibillion dollar worth industry worldwide. Internationally these are better referred as "Non-wood Forest Produce (NWFP) " or "Non-timber Forest Produce (NTFP)" and are defined as " Non Wood forest products including all goods of biological origin, as well as services, derived from forest or any land under similar use and exclude wood in all its form." This definition does not distinguish between MFP available wild in nature and the one that is cultivated. The definition of MFP however has been amended and as per a Govt. of Madhya Pradesh circular no. F-26/8/97/10-3 dated 15/5/1998, the term Minor Forest Produce is defined as "Non Wood Forest Produce, which can be exploited without harming the forest and will not include minerals as well as forest animals or animal parts."

Generally the term MFP is considered to be synonymous with medicinal and aromatic plants, but in reality the term MFP includes wide array of products from plant and animal kingdom having varied uses. As per one classification, MFP covers nine broad and seventeen sub categories of products. The nine broad categories are comprised of:

- Edible Plant and plant parts.
- Fatty oils (Edible & Non edible)
- Gums, Resins, Oleo-resins, Seed Gums etc.
- Medicinal Plants.
- Tans and dyes.
- Fiber & Flosses including grasses.
- Bamboos & canes.
- Petroleum substitutes.
- Misc. MFP (Products of animal & plant origin, Floral & decorative crafts etc.)

The above classification however excludes eco-tourism, which of late has caught imagination of planners and tourist alike and is likely to emerge as an important forest dependent commercial activity in service sector.

The spread and depth of MFP sector, in terms of different MFP categories and myriad of products in each such category is so vast that it is impossible for any single study to do full justice to the entire MFP sector while covering all its relevant aspects. Although every plant found in nature is useful in one or other way, but even if one has to account for only those MFP, which are of some commercial importance, then even this list will run into thousands. Just to give an example our traditional system of medicine alone recognizes some 1000-1500 plant species, associated with curative properties. The plants yielding essential oils are close to 3000 and at least 300 of these are of commercial importance. Thousands of plant yields gums and resins and several hundred of these are utilized to produce items of trade. Natural dyes are produced from close to 100 plants and like wise many plants yield edible products, minor oil, pesticides etc. This is in addition to hosts of alkaloids, flavonoids, tannins, glycosides, Terpenes etc. which could be extracted from these plants and further value added products down the chain.

Another impediment faced while attempting to conduct a study like this is the unorganized nature of MFP sector. Most of the trade takes place at local level, rendering its accounting quite difficult by any agency. The dearth of authentic secondary information and unorganized trade, therefore is quite a characteristic of the MFP sector, making the development planning for this sector a difficult task.

GLOBAL SCENARIO: As a rough estimate almost one fourth of our planet's area is covered by forest. which houses approx. 2.50 lakhs different varieties of plant. As per one study conducted by FAO there are at least 150 MFP including 26 essential oils, which are important from the point of view of international trade⁽²⁾ The total trade for these items is believed to be of the order of US\$11 billion. This list does not include various finished, semi-finished and other products based on MFP. For unprocessed MFP the trade flow is generally from developing countries to developed countries. USA, EEC, Australia and Canada are major importing countries of MFP. Amongst EEC. Germany is the main importer. On export side, the South East Asian countries chiefly amongst them China, India, Indonesia, Malaysia & Thailand are major exporting countries.

Worldwide, the plant-derived drugs is the largest industrial sector based on MFP. In addition to the uses of MFP in alternate/traditional medicine, which is quite common, these are also used in Allopathic medicines and up to 25% drugs contained in modern pharmacopoeia are of plant origin. The total international market for plant derived drugs is estimated to reach US\$ 30 billion by 2002.

Essential oil is another industrial sector where significant international trade takes place. The global demand for essential oil is placed at around 70,000 tonnes valued at US\$ 1 billion.

Amongst other sectors, where the international trade in significant quantities takes place is Gums & Resins (mainly gum Arabic, Karaya, Guar, Tragacanth etc.), Vegetable dyes (mainly natural food colours), Minor oil seeds (Coco butter substitutes), Animal Products (honey, lac etc.).

INDIAN SCENARIO: The Indian system of traditional medicine recognizes 1000 single drugs and 8000-9000 compound formulation⁽⁸⁾. There are 7000 licensed manufacturers in our country engaged in producing host of Ayur. formulations⁽⁹⁾. As per the survey findings the total size of herbal drug industry in the country is estimated to be around Rs. 3400 crores. which is likely to reach up to Rs. 6200 crores by 2004-2005. The raw herb market is estimated to be of the order of Rs. 350 crores.

Essential oil production in India is widely spread over numerous units of varying size right from field level distillation units to small and even medium size units. The Flavor and Fragrance (F&F) industry, which is the major end user industry of essential oil, has recorded a turnover of Rs. 1800 crores during 1999-2000. The growth in Pan masala, Gutika and series of crop aroma chemicals has been the major factor for the impressive performance of F & F industry⁽¹³⁾.

Even in other MFP sectors also the performance of the industry have been quite significant. The foreign trade statistics of the country as produced below provides useful clue on the significance of the indigenous MFP & related industrial sectors in international trade.

INDIA'S FOREIGN TRADE STATISTICS

(Rs. in Crores)

SLNo.	MFP	Export (1998-99)	Import (1998-99)	Export (1999-00)
1.	Raw herbs, herbal extraction, herbal drugs and related items.	732.77	148.70	650.65
2.	Essential oils and related items	254.42	119.60	331.52
3.	Gums & Resins	754.77	49.65	837.56
4.	Natural dyes, tannins and related items	18.93	137.63	20.73
5.	Minor oil seeds and related items	18.00	2.67	34.30
6.	Fiber, grasses and related items	19.31	9.62	21.97
7.	Edible products	307.17	0.50	362.02
8.	Lac & Related products	65.31	0.26	78.03
	TOTAL	2170.68	468.63	2336.78

Note : As no separate figures were available, in certain cases the figures presented above may even include figs. for those products which are not from natural source. .

Source: Directorate General of Commercial Intelligence & Statistics, Ministry of Commerce, Government of India.

There are many MFP sectors and products such as herbal cosmetics, handicraft items etc, which have not been mentioned above but which also employ MFP in some or other form.

Thus it is seen that India exported around Rs. 2336.78 crores worth of MFP & MFP related items in 99-00 and almost half of it consisted of raw herbs, herbal extracts, herbal drugs and gums & resins. The imports on the other hand in 98-99 were limited to roughly Rs. 470 crores and majority of this was in the form of vegetable alkaloids, mixture of odoriferous substances and Gambier & Wattle extracts.

MADHYA PRADESH: The total area of Madhya Pradesh is 4.43 lakh sq. kms. and almost 35% of this area (1.55 lakh sq. kms.) is covered with forest. It has the largest forest cover among all the states of India [@]

The forest area is not evenly distributed, the eastern part of the state accounts for majority of the forest area. There are 20 districts where the forest area is more than 33% of the their geographical area.

There are more than 500 different MFP available in the state. State Government through its various enactments from time to time has restricted private trading in few commercially important MFP, with a view to save villagers from exploitation of middlemen. These MFP are termed as Nationalized MFP and includes the following:

- ❖ Tendu Leaves.
- ❖ Harra
- ❖ Sal seed
- ❖ Salai Gum
- ❖ Kullu Gum

Rest all MFP are termed as Non-nationalized and are allowed for free trade and any individual is free to collect these in any quantities for domestic and commercial consumption.

The responsibility for collection and marketing of Nationalized MFP rests with M.P. State Minor Forest Produce Co-operative Federation, a three tier co-operative structure, consisting of 1947 Primary Forest Co-operative Societies (PFCs), 80 District Unions and the Federation at apex level. From time to time the Federation also trades in Non-nationalized MFP, but their role in this is quite limited.

Most of the trade in Non-nationalized MFP is conducted through private traders. Over a period of time the network of private traders has developed into a well knit structure consisting of hundreds of traders at villages, blocks, tehsils and district headquarters.

@ As per pre-partition status, i.e. prior to 1st Nov. 2000

The village trader either makes MFP purchases on his own or at the instance of some bigger traders, in which case he gets a negotiated price for the quantity collected. Depending on the market dynamics, the material collected at various centers either flow to the bigger traders based at other trading centers or to the traders located at two wholesale MFP trading centers of the state viz. Katni and Dhamtari, or it may even be directly dispatched to traders outside the state.

The system of barter is still prevalent in most of the tribal pockets of the state. Usually it is the raw salt, which is used for the barter.

Exploitative practices adopted by middlemen such as under weighing of products, offering lower prices for MFP collected etc. are quite common. But on the other hand they offer twenty-four hour service, immediate cash payment and credit & loan facilities to the villagers.

The survey conducted for the assessment of MFP availability in the state covered in all 25 districts, which put together accounted for 76% of the total recorded forest area of the state. 14 of these districts were from eastern region of the state while rest 11 were from western region. The survey team contacted 250 traders located at 110 trading centers of the state.

The findings of the survey are summarized below:

- ❏ Although more than 500 different types of MFP are available in the state, but the commercial trading takes place only in case of 80-85 MFPs.
- ❏ Almost 2.25 lakh tonnes of various MFP are being traded in the state.
- ❏ In terms of value the total amount of MFP traded in the 25 districts surveyed is around Rs. 190 crores. The eastern region accounts for 85% of this trading volume.

- ☛ The top 10 MFP contributed around 75% of the total trading volume, the rest 75 MFP contributed just 25%. The top 10 MFP (Non-nationalized) of the state are:

▪ Lac	▪ Tamarind
▪ Mahua	▪ Mango
▪ Char	▪ Safed Musali
▪ Aonla	▪ Kaladana
▪ Ashwagandha	▪ Cashew

- ☛ Based on the data of 25 districts, the total trade in Non-nationalized MFP for the entire state can safely be estimated to be of the order of Rs. 253 crores and if the trade in nationalized MFP is also included then the total trade generating from the state in MFP sector will be around Rs. 750 Crores.

The study team also collected data on existing MFP based industrial units of the state. The findings are summarized below:

- ☛ There are 538 industrial units in the state engaged in manufacturing MFP based value added products.
- ☛ Almost 60% (323) units manufacture herbal drugs. 80% of these units were located in western region of the state.
- ☛ Indore, Gwalior and Jabalpur were there important centers where most of these herbal drug units were located.
- ☛ The herbal drug units of the state manufactured almost all type of herbal medicine such as Antipyretic & Analgesics, Anti diarrhoea, Anti malarial, Blood purifiers, Anti allergic, Anti T.B., Cough Syrups, Laxatives, Diuretics, Pain killers etc.
- ☛ The next largest group of units manufactured edible items based on Mango, Tamarind, Honey, Ber . Char and Bhilawa. Most of these units were small in size except BEC Foods Ltd. at Rajanandgaon, which manufactures Tamarind paste along with various other fruit, based items. The installed capacity of this unit was 150 TPD.

- 👤 Herbal cosmetics was another important sector, which had presence of almost 34 units, including three well know national brands viz. Dabur, Baidynath and Ayur herbals.
- 👤 Lac and lac products manufacturing, though only concentrated in and around Bilaspur district, is also an important MFP based activity of the state.
- 👤 Four important industrial clusters were identified during the survey. These were Pharma units at Indore, Honey production units in Raigarh, Lac in Bilaspur and Babool seed powder at Bilha, Bilaspur.
- 👤 Most of the units of the state were not capital intensive in nature and were based on simple technologies, except few big units such as Dill oil extraction in Mandsour district and few Phyto-chemicals units at Indore & Gwalior which were capital intensive in nature and which deployed sophisticated manufacturing technologies.

MFP RELATED TECHNOLOGIES: The technologies pertaining to the MFP sector, which are available in the country, could broadly be categorized into four categories.

- ❖ Cultivation Technologies.
- ❖ Process Know-how.
- ❖ Production Technologies
- ❖ Product Application Technologies.

The report covers only first three types of technologies.

As per data collected by the survey team, the information on the technologies available in the country is summarized below

Technology Types	Number
1. Agro Technologies :	
Medicinal Plants	25
Aromatic Plants	25
Other economically imp. Plants	5
	55

2. Process Knowhow	
Extraction of Alkaloids & Drug Intermediates	27
Essential Oils & Chemicals	31
Drugs & Drug Formulations	12
Extraction of Natural Dyes	7
Herbal Cosmetics	10
Food Processing	10
Lac & Related Technologies	25
Misc. MFP based Products	29
	151
3. Production Technologies	9

In addition to above, substantial research work is also being carried out in private sector, universities and other research organizations.

The main technology providers from the Govt. Sector are Regional Research Laboratories of CSIR such as Central Institute of Medicinal & Aromatic Plants (CIMAP), Lucknow; Regional Research Laboratory, Jammu(RRL(J)); Central Drug Research Institute, Lucknow(CDRI); National Chemical Laboratories, Pune(NCL); Central Food Technology Research Institute, Mysore, (CFTRI); National Botanical Research Institute, Lucknow(NBRI); etc. and Oil Technology Research Institute, (OTRI), Anantpur. In the field of herbal extraction and grinding, few new technologies which are of recent origin are:

- ❖ Super Critical Fluid Extraction.
- ❖ Cryo/Cold grinding of herbs.
- ❖ Microwave Assisted Extraction.
- ❖ Continuous Steam distillation.

Most of these technologies offer extracts with superior organoleptic profile. The resulting extract is more representative of the raw material.

The report also presents details of MFP related patents filed worldwide, to indicate the future direction of research in MFP sector.

POTENTIAL FOR MFP BASED INDUSTRIES IN M.P. : Based on the inference drawn while analyzing the availability, market and technology related data, the study team has identified few potential MFP based projects which could be promoted in the state.

The projects suggested are of three types (i) those, which are based on MFP available in bulk in the state (ii) Projects, which are based on Cultivated MFP, and (iii) Projects for the development of wasteland.

The details of projects suggested are as under :

POTENTIAL PROJECTS	Nos.
(A) Based on MFP available from wild	
1. Tamarind based	7
2. Mango based	5
3. Aonla based	2
4. Mahua based	3
5. Charota based	2
6. Babool based	1
7. Lac based	5
8. Karanj based	2
9. Kosum & Palash	1
10. Bhilwa	1
11. Neem	4
12. Bel	1
13. Nagarmotha, Van Tulsi (Essential oil)	1
14. Harra	2
15. Herbal Extraction (Various herbs)	1
16. Misc. Projects	2
(B) Based on cultivated MFP :	
1. Cultivation of Aromatic Plants*	
2. Cultivation of Medicinal Plants*	
3. Cultivation of Sisal*	
4. Sisal based projects	4
5. Extraction of herbs	2
6. Extraction of essential oils & chemicals	3

POTENTIAL PROJECTS	Nos.
(C) Projects for Wasteland Devp. :	
1. Cultivation of Jojoba, Sanay and Ratanjyot*.	
2. Jojoba based project	1
3. Sanay based project	1
4. Ratanjyot based project	1

* No. of Farmers could be motivated to take up the cultivation

Projects, which require further investigations from the point of view of either market or technology, have been indicated appropriately. The volume II of the report presents detailed project profiles for 25 selected projects.

RECOMMENDATIONS: It is a stark reality that without any long term plans and action thereon; for the development of MFP, the future of MFP based industries will always remain a big question mark. The prolonged and sufficient availability of MFP is the most crucial aspect of promotion of MFP based industries.

In addition, there are various other issues which also needs to be addressed on top most priority. Some of these are:

- ☛ To devise suitable mechanism for improving the collective bargaining power of MFP collectors and creating infrastructure for providing market related upto the village level.
- ☛ To arrange for an assured buy back arrangement of MFP collected through marketing intermediaries such as TRIFED etc. in all the districts.
- ☛ Tenure and usufruct rights are necessary ingredients for sustainable management and development of MFP sector. Clear-cut & long-range plans are therefore necessary in this direction. MFP based industrial units could also be provided forestland on lease to cultivate their requirement of MFP, with the help of local villagers.
- ☛ To provide proper education to villagers for preservation of endangered species and for restricting destructive harvesting practices adopted by them at times.
- ☛ Need to define and retain intellectual property rights on MFP based discoveries and traditional knowledge, and to develop collaborative

arrangement between potential economic users and source communities in order to guarantee profit sharing in the form of royalties, if commercial products are forthcoming then to provide for adequate technology transfer as well.

- ☛ To involve Agriculture Universities and the State Agriculture & Forest Department in marketing & demonstration of the agro-technologies developed by RRLs and similar other institutions. These centers also to act as **ONE STOP MFP FACILITATION CENTERS** for assisting cultivators in procurement of planting materials and in marketing of produce.
- ☛ To explore possibilities of collaborative effort with multinational pharmaceutical companies for development of drugs based on indigenous technical knowledge.
- ☛ To create accredited testing facilities in the state for undertaking detailed chemical analysis of MFP & MFP based products; also to nominate agencies for promoting such quality certification.
- ☛ To establish nurseries, atleast one at each divisional level for supply of MFP planting material.
- ☛ To involve MFP Federation and State Agriculture department in collection of data on MFP availability, cultivation & trading network.
- ☛ To establish MFP Nodal Information Centers at important locations within the state for providing MFP related information to cultivators, processors & traders and for networking between institutions on one hand and investors & cultivators on the other.
- ☛ To organize sensitization / awareness programmes for various groups associated with development of MFP sector at regular intervals.
- ☛ National standards, quality control and certification procedures are required to be evolved according to market requirements.
- ☛ Efforts are required to improve statistical information on resource base, production, value addition and trade & other information to develop plans and strategies for development of the MFP sector.
- ☛ To sponsor district-wise studies for preparing location specific Common Facility Centre's proposals, and take action to establish them at important locations, involving participation of local population.

Thus to conclude MFP based industries have good potential, looking to the changing worldwide perception of consumers towards **"GREEN PRODUCTS"** and this opportunity could easily be encashed for the development of local as well as national economy, provided sincere efforts are made for the management and development of the MFP sector.