

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly Peer Reviewed Journal)

Vol. 5, Issue 1, Januray 2016

A Study on Plant Product Extraction and Indian Economy

Ramesh Baboo,

Assistant Professor, Dept. of Chemistry, Govt. Girls P.G. College, Fatehpur, U.P., India

ABSTRACT: Natural plant products are a source of new chemical diversity and are the choice of today's world. The sources of natural product are plants, animals and microorganisms. Among them plant and its products are more reliable for its renewability and therefore, considered as catalyst for human welfare. There has been increasing trends in the trade of natural plant products and their extraction at industrial level, particularly that of non-wood natural plant products. Increasing trade in natural plant products has supported economic growth and has helped in reducing poverty in a number of emerging countries. There is strong evidence that natural plant products play a significant role in the livelihoods of the world's rural poor. Natural plant products are the main source of income for the forest dwelling population in many countries. The natural plant products trade depends on availability, production, marketing and the dependency of rural population on natural plant products. It is very important to understand the production and trade status of natural plant products and how these products can be used in an improved way to reduce poverty. A high trade status of natural plant products at global, national level as well as regional level can improve the economy of that particular country.

KEYWORDS: Chemical diversity, Extraction and Natural plant products.

I. INTRODUCTION

Natural plant products consist of goods of biological origin other than wood, derived from plant. They have been used by forest dwellers for their welfare or livelihood commodity since long and are traditional source of food, fiber, medicine etc. The forest dwellers mainly belong to tribal communities. It is estimated that 25 percent people of the most of the country depend to varying degrees on the plant's resources for their livelihood and many of them living in or near dense forest depend highly on them for their livelihood [1]. Some 80 percent of the people living in developing countries depend on non-wood natural plant products, such as fruits and herbs, for their primary health and nutritional needs. The most used categories of non wood natural plant products are medicines and edibles [2].

The therapeutic potential of plant products can be traced back to over five thousand years as there is evidence of its use in the treatment of diseases and for revitalizing body systems in Indian and other civilizations [3]. Also India is one of the mega diversity hot spots with rich heritage of traditional knowledge of classical medicines. Therefore in India, plants of therapeutic potential are widely used by all sections of people both as classical medicines in different indigenous systems of medicine like Siddha, Ayurveda and Unani and also as processed product of pharmaceutical industry [4]. India has about 4.5 million plant species and among them estimated only 250,000- 500,000 plant species, have been investigated phytochemically for biological or pharmacological activity. Still a large number of higher plants as a source for new therapeutics are to be explored. The potential for developing phytomedicine into various health care products appears rewarding, both from the perspective of economy and safety. Many plant extracts are quite effective than the synthetic ones with no or insignificant side effects and very little scientific research on their biological activity has been worked out [5].

The growth of multi drug resistant microbial strains which are limiting the effectiveness of synthetic drugs led to awareness among the common people against the use of synthetic product [6]. This factor forced the scientists to develop methods of bioprocesses for the production and extraction of compounds from natural renewable sources for their potential application in food, cosmetics and pharmaceuticals industry with antimicrobial, antioxidant, anti-inflammatory and anti diabetic activity [7].

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly Peer Reviewed Journal)

Vol. 5, Issue 1, Januray 2016

II. NATURAL PLANT PRODUCTS AT INTERNATIONAL TRADE

Among the most important natural plant products contributing to international trade are medicinal plants (US\$ 689.9 million), nuts (593.1), ginseng roots (389.3), cork and cork products (328.8), and essential oils (312.5) [8]. At least 150 non wood natural plant products (e.g. honey, gum arabic, edible bamboo, cork, forest nuts and mushrooms, essential oils and plant parts for pharmaceutical products, etc.) are significant in international trade. More recently, the commercial value of mushrooms and floral greens was an estimated \$40 million and \$29 million, respectively, every year over the past 10 years [9]. According to WHO, the majority of the world's human population, especially in developing countries, depends classical medicines based on map. A survey of published medicinal floras conducted by members of the medicinal plant specialist Group of the Species Survival Commission, the World Conservation Union (IUCN) suggests that 72,000 species of higher plants are used medicinally worldwide, approximately 17 percent of the world's higher plant flora. Relatively few map species are cultivated. The great majority is still provided by collection from the wild [10]. The monetary value of Medicinal and aromatic related global trade is over 60 billion usd. [11].

III. NATURAL PLANT PRODUCTS AT NATIONAL TRADE

Non wood plant products & logging contributes to 1.38% of India's GVA [12]. The Indian forest products industry had total revenue of \$65,844.6 million in 2011, representing a compound annual growth rate (CAGR) of 5.5 percent between 2007 and 2011. The performance of the industry is forecast to accelerate, with an anticipated CAGR of 7.7 percent for the five-year period 2011 - 2016, which is expected to drive the industry to a value of \$95,467 million by the end of 2016.

India's rich biodiversity of numerous plant species is spread across 16 agro-climatic zones. Out of these, about 3000 non wood plant species yield are found but only 126 have developed marketability [13]. These include medicinal plants, edible plants, starches, gums and mucilage's, oils & fats, resins & oleo-resins, essential oils, spices, drugs, tannins, insecticides, natural dyes, bamboos & canes, fibers & flosses, grasses, tendu leaves and edible products. In India over 50 million people are dependent on non wood plant products for their subsistence and cash income [14]. Minor forest products contribute about 50 percent to Indian government forest revenue and 70 percent of forest-based product exports. About 70 percent of the non wood plant product collection in India takes place in the tribal belt of the country [15]. Another study highlighted that tendu leaves were estimated to provide employment nearly to 4 million persons annually by way of Bidi manufacturing [16]. It observed that forest based enterprises provided up to 50 percent of income for 20 to 30 percent of labor force in India [17]. India holds monopoly in world trade over some of the non wood plant products such as karaya gum, Indian gooseberry, sandalwood chips and dust. The export of non wood plant products has grown by 20-25 percent over the past few years and during 2006-07, India earned Rs 39.7 billion from export of non wood plant products and their valued added extracts [18]. Total export value of Ayush and Herbal products from India is estimated as Rs. 764.25 and 570.76 crores respectively during 2009-10 [19]. India stands at third position with a share of about 16 percent in essential oil trade. Indian production of the essential oils is estimated to be 17 000 tonnes valued about US\$ 195 million [20].

IV. CONTRIBUTION OF INDIAN STATES

In the case of Gujarat, the contribution of non wood plant products to the total households' income varied from 20.1 to 34.1% while in the case of West Bengal, it ranged from 26.5 to 55.5 percent [21]. Studies in Indian states of Orissa, Madhya Pradesh, Himachal Pradesh and Bihar have also indicated that over 80 percent of forest dwellers depend entirely on non wood plant products, 17 percent landless depend on daily wage labour mainly on collection of non wood plant products and 39 percent people are involved in non wood plant products collection as a subsidiary occupation. Non wood plant products revenue of the Uttar Pradesh state from the 18 divisions of Terai, Bundelkhand and Bindhyan region constitutes about 80 percent of the total revenue of the state. In terms of value realized to the state, tendu leave collection returns maximum among the non wood plant products and comes only next to that from timber. But, at the household level, other non wood plant products dominate in terms of returns [22]. Average return from non wood plant products collection per household per season in three Bundelkhand forest divisions is found to be Rs 6225. A study in Lalitpur district shows the income from non wood plant products to be 12 percent (Rs 1587) of the total income [23]. In Kerala state, one hundred and twenty items of the non wood plant products, mainly medicinal plants

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly Peer Reviewed Journal)

Vol. 5, Issue 1, Januray 2016

permitted to be collected from the forests by the tribal people and 96 species by tribal cooperatives. About 56 percent of their total income is from the non wood plant products [24]. The largest consumer of the forest products is the state's Ayurvedic industry. Nearly 80 percent of the Indian traditional medicine industry is situated in Kerala with a predicted growth rate increase of 35 percent annually. The annual production of resins has been estimated as in Andhra Prdaesh (160 tonnes), Himachal Pradesh (6500 tonnes), J & K (1693 tonnes) and Utrakhand (19608 tonnes) during 2009-1 [20]. The potential of production of Tendu leaves in Chhattisgarh is approximately 18 lakhs standard bags annually, which is nearly 20 percent of the total tendu leaves production of the country. Madhya Pradesh is the biggest Tendu Leaves producing State of India. The average annual production of Tendu Leaves in Madhya Pradesh is around 22 lakhs standard bags, which is nearly 25% of the total Tendu Leaves production of the country [25].

Collection of Tendu leaves was done in the scale of standard bags and the details of trade of Tendu leaves for five years (2010 – 2014) in state of Madhya Pradesh is given in Table I.

Table I

Year	Collection In lakh S.B.#	Collection Rate per S.B	Collection Wages In Rs. Crores	Quantity Stored	Quantity disposed off	Sale Price In Rs. Crores	Expenditure In Rs. Crores	Net receipt In Rs. Crores
2010	21.24	650	138.11	21.24	21.24	332.89	179.71	153.18
2011	17.06	650	110.85	17.06	17.06	310.06	154.10	155.96
2012	26.06	750	195.45	26.06	26.06	634.13	245.94	388.19
2013	19.92	950	189.28	19.92	19.92	394.89	247.04	147.85
2014*	16.99	950	161.42	16.99	16.99	310.12	195.14	-
*Figures to be finalized # S.B. stands for standard bag								

Data of Tendu Leaves Trade (Madhya Pradesh)

V. CONCLUSION

Collection of above data and discussion shows that the non wood plant products industry depends on the trade of the medicinal plant, their parts and extraction of the bioactive materials rather than non medicinal plant products. Perusal of the above data indicates that the non wood natural plant product industry or trade in India or at international level is not up to the mark. The lack of technology, wastage of raw material of plant parts, exhaustive cutting of forests and improper attention of the government's bodies towards the forestry are the main causes behind under development of the national trade of plant products at international level. Improper logging of plant species as well as their identification for biological activities and insufficient availability of clinical trial does not provide whole capacity of the medicinal plant products to treat the diseases. Collection of the revenue is also decreases. Considering the medicinal property of the plant bioactive compounds it has become a necessity to build up a standard towards an integrated approach to extract, purify and characterize active compounds and ultimately to test biological activity of the active compound. The extraction of bioactive compounds from plant materials is the first step in the utilization of phytochemicals in the preparation of dietary supplements or nutraceuticals, food ingredients, pharmaceutical and cosmetic products. Generally, freeze drying retains higher levels of bioactive content in plant samples than air-drying. Solvent extractions are the most commonly used procedures to prepare extracts from plant materials due to their ease of use, efficiency, and wide applicability.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly Peer Reviewed Journal)

Vol. 5, Issue 1, Januray 2016

REFERENCES

- [1] Killman, W. 2003. "Non-wood News", March 2003, p.1.
- [2] Bouri and Mukharjee, 2013, Documentation of traditional knowledge and Indigenous use of non- timber forest products in Durgapur forest range of Burdwan district, West Bengal. Paper presented in National Seminar on Ecology, Environment & Development 25 - 27 January, 2013, organized by Department of Environmental Sciences, Sambalpur University, Sambalpur.
- [3] Mahesh and Satish, World Journal of Agricultural Sciences.4: 839-843, 2008.
- [4] Srinivasan *et al.* Journal of Ethnopharmacology. 74: 217-220, 2007.
- [5] Friedman *et al.* Journal of Food Science. 72: M207-M213, 2007 and Serafinao *et al.* BMC Immunology 9: 17, 2008.
- [6] Sundsford, Acta Pathologica.Microbiologica Scaninavica .112: 815-837, 2004. Edith *et al.* 2005, Hancock, Lancet Infectious Diseases. 5: 209-218, 2005.
- [7] Velioglu *et al.* Journal of Food and Agricultural Chemistry.46: 4113-4117, 1998. Oreopoulou and Tzia, Utilization of by-products and treatment of waste in the food (Eds). Springer. USA. pp 209-232, 2007.
- [8] Walter, Certification and benefit-sharing mechanisms in the field of non-wood forest products – an overview , 2003.
- [9] Cocksedge *et al.* Critical information for policy development and management of non timber forest products in British Columbia: Baseline studies on economic value and compatible management (executive summary), 2006.
- [10] Srivastava *et al.* Medicinal Plants: An Expanding Role in Development. World Bank Technical Paper 320. World Bank, Washington, D.C., 1996.
- [11] Karki and Nagpal, Marketing Opportunities and challenges for Medicinal, Aromatic and Dye plants – a position paper presented at the International Workshop on Medicinal Herbs & Herbal Products: Livelihoods & Trade Options – How to make market work for poor?, 2004.
- [12] Economic Survey, Ministry of Finance, 2014.
- [13] Maithani, G.P., Minor Forest Produce. MFP News, October-December, 1994, Dehradun.
- [14] Hegde *et al.*, Economic Botany 50: 243-51, 1996.
- [15] Mitchell *et al.*, Non timber forest products: Availability, production, consumption, management and marketing in Eastern India, 2003.
- [16] Namdeo and Pant, Journal of Tropical Forestry, 10 (1): 36-44, 1994.
- [17] Pillenahalli Basavarajappa, Non-Timber Forest Products for Food and Livelihood Security: An Economic Study of Tribal Economy in Western Ghats of Karnataka, India. M.Sc. Thesis, 2008.
- [18] Ganguli, Minor Forest Produces feel the heat of rising Rupee. The Economic Times, 2007.
- [19] State Forest Sector Report, India, 2010.
- [20] Varshney, Int. J. For. Usuf. Mngt. 2(182): 51-58, 2001.
- [21] Kant S., Journal of Sustainable forestry, 4(1/2):33-61, 1997.
- [22] Choudhury P. R., Forest-route to poverty alleviation- Myths and Realities: Analysis of non wood forest products- livelihood linkages in some Indian States, 2007.
- [23] GDS, 2004.
- [24] Thomas, Collection and marketing of non-timber forest products by the Kirala Girijans. Centre for Minor Forest Products, Dehra Dun, India, 1996.
- [25] <http://mfpfederation.org>.