

SURVEY OF COMMERCIALY IMPORTANT FLORA AND FAUNA IN PUNJAB (2009)

(Sponsored by: Govt. of Punjab)

Summary

Biological diversity comprising the variability of genes, species and ecosystems, is essential for maintaining the basic processes on which life depends and is a key to sustainable development. Bio-resources provide food, medicine and products of commercial and non commercial use and also maintain life by providing environmental services like, air & water quality, soil fertility, pest and disease control, waste disposal etc. Increasing human population, industrialization, intensive agricultural & animal husbandry practices and over-exploitation of natural resources are, however, threatening our bio-resources. The present document defines the commercially important flora & fauna in the state which are used by the biodiversity based industries.

This document covers both natural and agricultural systems and attempts to collect & collate available data on wild & domesticated species/varieties of flora & fauna. It attempts to promote conservation and sustainable use of the State's biological resources by promoting awareness amongst the peoples and cooperation between stakeholders.

Punjab is one of the smaller states of India with an area of 50,362 sq. km located in the northwestern part of the country. The state comprises of twenty districts. Except for the sub-Himalayan Shivalik foothills in the north eastern borders, the area is generally plain. The climate of the state is sub-tropical. Land in the state is mainly shared by activities like, agriculture (84%) and forests (6.07%), besides built up areas, water bodies, wastelands, etc. The state has achieved tremendous success in the economic and food front.

The natural forests in the state are found in the Shivalik area in the districts of Ropar, Hoshiarpur & Gurdaspur, and in form of Bir forests in district Patiala and Mand forests around wetlands. To protect the existing biodiversity 12 protected areas have been identified. Two community reserve (Keshopur & Lalwan) areas also exist. For ex-situ conservation of biodiversity, one zoological park, one tiger safari & 3 deer parks have been set up. Several botanical gardens also exist.

The state of Punjab has an agricultural base but a large number of economically important wild flora and fauna also exist in the state. These include several medicinal plants, minor forest produce and nutritional supplements, which have great commercial potential in biodiversity based industries. Many SC/ST communities are involved in trade of products (like brooms, ropes, fans,

mats, etc.) made from biological resources like grasses, leaves and roots. In some areas cultivation of medicinal plants has also been promoted by the Department of Forests for extraction of oil and alkaloids. Further, several self-help women groups are also established in the state which are preparing products like pickles, powders, juices, etc. from amla (*Phyllanthus emblica*), Lassora (*Cordia oblique*), Shivlingi (*Bryonopsis laciniosa*), Harar (*Terminalia chebula*), Bahera (*Terminalia bellerica*), Dheun (*Artocarpus lakoocha*), etc. Many villagers are also dependent for their livelihoods by harvesting products like Bhein (*Nelumbo nucifera*), Singhara (*Trapa bispinosa*), etc. Further, many hakims & vaidas depend upon harvesting and processing of many medicinal plants which are found in the state.

Major forest produce is timber. 129 cubic meters of timber was produced in 2005-06 with total value of 123602 thousand rupees. Minor forest produce in Punjab are Bamboos & canes (Rs.14782069), fodder & grass (Rs.2318125) and others (Rs.1161589) in 2006-07.

Non Wood Forest Products are people's products and their uses form an integral component of not only of local economies and culture from time immemorial but also find their way in trade. NWFPs are significant source of subsistence products, employment and household incomes in areas near forests. Customarily, majority of workers in NWFP related economies are women.

Medicinal and herbal raw materials are processed into final form (i.e. capsule, pill, cosmetic, tea, lotion, etc.) by industry and distributed throughout the world to health food stores, over-the-counter drug stores, and prescription drug pharmacies. Natural medicinal and herbal products involves the use of leaves, stems, roots, bark, seeds, fruit, flowers and buds to make teas, tonics, powder, snuff, poultices, salves, tinctures, lotions, and smoke inhalers.

NWFPs include foods (nuts, fruits, mushrooms, honey, gums); food additives (spices, herbs, flavorings, sweeteners); fodder; fibers (furniture, clothing, construction); fragrances for perfumes; ornamental pods and seeds; resins; oils; plant and animal products with medicinal value. Although many NWFPs are collected on a local level by peasants, some NWFPs have been successfully domesticated for large scale production.

0.2 millions small scale industries and 569 large and medium scale industries functioning in the state involved fixed capital investment of Rs. 5400 million and Rs.20400 million respectively. Yarn and textile (23%), hosiery and readymade garments (13%), rice (12%) and sports goods (5%) are major items exported from the state.

Data collected from District Industries Centers reveals that out of 20940 small scale enterprises in Punjab, 212 units are for manufacturer of pharmaceuticals & Botanical products, 6081 Food Products & Beverages, 7 Tobacco Products, 3168 Textiles, 394 Hosiery & Garments, 4263 Leather & Leather Products, 2783 Wood Products, 754 Paper & Paper Products, 647 Rubber Products and 2621 Furniture.

Data collected from Department of Punjab Medicinal Plant Board reveals that there are 255 herbal industries in the state. These pharmaceutical industries using the raw materials from plants like Amla, Ashwagandha, Brahmi, Giloe, Tulsi, Pudina, Sarpagandha, Shankhpushpi, Vai-vidang, Satavari, Safed Musli, Bach, Mulethi, Bahera, Stevia, Gumar, Kantkari, Ghritkumari, Pathorpura, etc. These plants are cultivated in the state.

Eighty four percent of the state area is under agriculture with intensive cultivation. Currently the cropping intensity is 186% with wheat as dominant Rabi season crop and rice & cotton as dominant kharif season crops. Other crops include potato, maize, sugarcane, pulses, oil seeds and vegetables. After great strides in the field of agriculture, Punjab is laying emphasis on promoting industrial growth in the state, especially with respect to production of pharmaceuticals, leather goods, food products, textiles, sugar, paper and paper packaging, etc. Most industries are located in and around Ludhiana (known as Manchester of India), as well as Jalandhar and Amritsar.

Microbial biodiversity, being an integral part of biodiversity includes bacteria, archaea, fungi, algae, protozoans and protists. Microbes have several uses in biotechnology for production of new kind of antibiotics, novel enzymes from thermophiles/alkaliphiles, pharmaceutical products and as biofertilizers in agriculture.

The state's natural ecosystems, rich in animal and plant life are facing problems of overexploitation and degradation. Hence, for maintaining the state's economic prosperity in future, concerted efforts would be required to protect the environment and promote sustainable use of state's flora & fauna (natural resources).