

Indian march from forestry and agrobased traditional knowledge to industry based pharma industry

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Agroforestry was born as a branch of forestry in 1960 at FRI, Dehradun to optimize production and economic returns per unit area in lieu of sustainable development besides meeting the social, cultural, religious, spiritual needs of human beings and maintain ecological equilibrium of the biome. Along with social forestry, farm forestry, organic farming and herbal gardens, agroforestry is also the answer to the good and technique based raw materials to the Pharma industry and alternative therapies such as Ayurvedic, Unani, Sidha, Homeopathy and Tibetan traditional system to meet the needs of domestic medicinal markets and as an export earner.

Key words: Traditional knowledge, Agroforestry, Medicinal wealth, Pharma industry.

INTRODUCTION

AS megabiodiversity centre of the world, India is a hotspot for a variety of forests having 8 distinct floristic regions and 16 main natural formations with several subtypes (Aren, 2002). Despite a forest policy which dates back to 1894, rising human and cattle population, deforestation, forest fires, denudation, shifting cultivation, commercial exploitation of flora and biopiracy, placed forests under constant pressure, necessitating comprehensive and holistic forest policy with priorities of efficient and sound forest management, conservation and sustainability which was framed as NFP by the government of India in 1952 and approved by MEF in 1988 and recommended the need based and time bound programme of afforestation and strip planting of trees along roadside, canal-side, railway track, urban and industrial areas along with development of village and community lands and encouraging agroforestry and farm forestry for increasing productivity & tree cover area (Tiwari, 1991) hand in hand the renaissance of the traditional herbal medicine (Wealth of India, NISCAIR's 15 Volume Publication from 1987-1996). Recent traditional knowledge based ethnobotany has made quantum jump from social forestry, agroforestry, herbal forestry to pharma industry deriving new drugs from plants by Micropropagation, Meristem culture, Somatic embryogenesis, Somaclonal variation, Andro and Gynogenesis, Protoplast fusion, Somatic hybridization, Clonal propagation, Provenance trials, Metabolic engineering, Tissue banking, Genetic engineering and Component labeling for heavy metals and pesticides of raw drug materials (Mathur, 2005; Arya *et al.*, 1993; Singh *et al.*, 1994; Soni *et al.*, 2000; Singh and Vats, 2006). Application of GIS on human health environment especially in relation to epidemiology and vector borne diseases is also important aspect of the subject under reference (Pandey, Tiwari and Sadhana, 2005). Scope of remote sensing and GIS in forestry and ecology has been emphasized by Kushwaha (2005) and utility of PCR method for biodiversity and biosystematic studies in plants using DNA profiling method, RAPD, ISSR and DAMD in genetic diversity assessment cannot be overstated (Ranade, 2005; Singh & Raychoudhury, 2005).

Agroforestry and its scope in people welfare:

In 1985, National Waste Lands Development Board (NWDB) was set up for afforestation through people's participation. The 8th (1992-1997) and 9th (1997-2001) five year plans of forestry laid

main thrust on "Biodiversity conservation (BDC) and Joint Forest Management (JFM)" aimed at benefiting both the local people as well as country at large. Along with Social Forestry, Urban Forestry, Farm Forestry was launched in the late 1970 with the main focus on planting trees by government on village lands and uncultivated lands (BISR, 1986; Chaturvedi, 1979; FAO, 1988; Bhattcharya, 1990; Tiwari, 1991; Saxena, 1996) to improve the biological productivity and economic return of the same piece of land. This type of forestry includes Peripheral planting on field boundaries and Block plantation along with usual agricultural practices including herbal gardening.

The Agroforestry in India was initiated in 1960 by FRI, Dehradun and State Forest Departments chiefly to develop potential technologies in areas like Shifting cultivation, Taungya system and Agri-silvi culture and Tree farming.

JFM is the latest concept in forestry (Mukherji, 1994; Shahbaz, 1998) where people are directly involved in the production and management of forest and forest products along with the government officials (Status report on JFM in U.P. by Government Forest Department; Anon, 1993).

Social forestry or sharing in took off in 1976 after the national commission on agriculture recommended intensive planting programmes (Banerjee & Mishra, 1994; Guha, 1990; Mukherji, 1994).

Agroforestry/Farm forestry/ Taungya system thus, is a part of a social forestry to meet needs of a society vis-a vis fuel, fodder, small timber, fruits, wind breakers, herbal medicines, water erosion, environmental conservation and materials for cottage industry. Agri-silvi culture is a system, which involves the use of lands for the production of forest crop and agriculture crops while Silvi-pastoral system is a land management system in which forests are managed for the production of wood and rearing of domestic animals and are part of social forestry therefore.

In Uttar Pradesh, the Agroforestry system has been adopted on a fair scale covering an average area of about 10,000 to 12,000 ha/annum. Two practices in vogue under the system are raising Sal by Taungya system in forest divisions of Gorakhpur and Gaunda. The second is to auction the lease for raising agricultural crop between the trees in lines in the large scale of mechanized plantations of Eucalyptus, Popular etc. raised by the State Forest Department being followed in Haldwani, Tarai, Bhabar and Ramnagar etc. (Guha, 1990). DFO, Meerut in addition, is trying to take steps towards social forestry and establishment of herbal gardens under agroforestry programme in Hastinapur Forest Range.

Renaissance of traditional knowledge and phytotherapy

*Based on a lecture delivered before the forest personnel at Hastinapur

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