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# SIGNIFICANCE AND COMFORT OF NATIONAL AGROFORESTRY POLICY IN INDIA: A REVIEW

**SAYANDIP CHAKRABORTY, VIKRAM SINGH* AND VISHAL JOHAR AND ARIYANT SEN**

*Department of Horticulture, School of Agriculture,*
*Lovely Professional University, Phagwara 144 411, Punjab, India*

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**ABSTRACT**

**Agroforestry is defined as a land use system that integrates trees and shrubs on farmlands and rural landscapes to enhance productivity, profitability, diversity, and ecosystem sustainability. It is a dynamic, ecologically based, natural resource management system that, through the integration of woody perennials on farms and in the agricultural landscape, diversifies and sustains production and builds social institutions. Agroforestry systems include both traditional and modern land-use systems where trees are managed together with crops and or/ animal production systems in agricultural setting.Agroforestry is practised in both irrigated and rain-fed conditions where it produces food, fuel, fodder, timber, fertilizer, and fibre, contributes to food, nutritional and ecological security, sustains livelihoods, alleviates poverty, and promotes productive and resilient cropping and farming environments. The major policy goals are: Setting up a National Agroforestry Mission or an Agroforestry Board to implement the National Policy by bringing coordination, convergence, and synergy among various elements of agroforestry scattered in various existing, missions, programs, schemes, and agencies pertaining to agriculture, environment, forestry, and rural development sectors of the Government. Improving the productivity; employment, income, and livelihood opportunities of rural households, especially of the smallholder farmers through agroforestry.**

**KEY WORDS :** Ecosystem, Rural development, Timber, Food, Fuel, Fodder, Fertilizer, Fiber etc.

## INTRODUCTION

Since ancient times, both in the tropics and in temperate regions, there has been a careful blending of different tree species with livestock and/or agricultural products (Chavan *et al*., 2015). People have historically used agroforestry practices for the mutually beneficial effects of the three components of trees, crops, and livestock as well as the 6 Fs like food, fruit, fodder, fuel, fertilizer, and fiber (Sharma *et al*., 2017). The cycle of nutrient exchange and the advantageous side effects of each element made agricultural production processes sustainable (Chavan *et al*., 2015). This type of effort is for the upgrade of germplasm and the development of multipurpose trees and forest species (Baig *et al*., 2008). Agroforestry systems have the potential to be a useful tool for reducing climate change and preparing for it. The economic elements of farming land productivity are also connected to agroforestry practices. According to studies, these agroforestry systems can produce 450 man-days of employment per hectare annually. Even though agroforestry practices have many advantages, the majority of farmers have been reluctant to adopt these systems on a large scale, mainly because of certain concerns about the tree component, such as long rotation, a reduction in gross area, difficult legal processes associated with the trade in tree farming, and market fluctuations (Dhyani *et al*., 2020). Due to multiple outputs, maintained agricultural production, various incomes, mitigation of climatic aberrations, and technical innovations led by research institutes and corporate organizations, agroforestry has recently drawn increased attention. Despite the enormous potential, one of the main

obstacles to the widespread adoption of agroforestry is the absence of clear legislation and norms for the harvesting, transportation, and sale of agroforestry products (Place *et al*., 2013). The National Bamboo Mission (NBM) of the Ministry of Agriculture, the RashtriyaKrishiVikasYojana (RKVY), the National Horticulture Mission (NHM), the National Biofuel Policy, and other initiatives have been launched by the Government of India (GoI), giving the much-needed push for integrating forestry components on farmlands (Rode *et al.*, 2023). From agroforestry we get big profit and agroforestry protects this profit and prevents much disaster.

**Wadi model: a livelihood program**

Initiated by the BAIF Development Research Foundation in south Gujarat in the 1980s, the Wadi initiative was then extended to many tribal areas of India. Maharashtra, Gujarat, Karnataka, Uttar Pradesh, Uttarakhand, Rajasthan, Madhya Pradesh, Chhattisgarh, Bihar, Andhra Pradesh, and Jharkhand all have an agri-horti-silvi model. As an illustration, horticulture crops like amla, mango (10x 10 spacing), and cashew (7x 7 spacing) with intercrops produced in these intervals and trees like gliricidia, and subadult planted in tighter spacing on the border in an area of 0.4–1.0 hectare(Chavan *et al.*, 2015). Over 1.81 million people have received assistance from BAIF to create 68,586 hectares of wadi thus far. This idea is a complete strategy for managing natural resources; the adoption of sustainable agricultural practices improves rural communities and provides security of livelihood (Kumar *et al*., 2021).

**Global policy efforts in agroforestry**

To have a separate policy that solely establishes the framework for the development of agroforestry as a key to sustainable farm production, however, is essential given the significant role that agroforestry plays in sustainable food production, ecosystem services, and economic benefits. The advantages and services provided by these systems are extensively established and backed up by several policy efforts carried out globally by various countries, including major European countries, Kenya, Malawi, etc. (Wilson *et al*., 2016). All of these strategies are primarily intended to lower risk while raising returns on small-holder investments. "Advancing agroforestry on the policy agenda" working paper The Food and Agriculture Organisation discussed many global policy proposals. The National Steering Committee on Agroforestry (NSCA) serves as an extension organization in Malawi by spreading field-level success stories and identifying and removing barriers to ineffective technologies.


**Fig. 1.** Benefits and preventing natural disaster

Agroforestry is covered separately in an article by the European Commission, which offers subsidies for agroforestry plots with a minimum of 50 trees per hectare (Buttoud *et al.*,2013). The National Agricultural Policy of 2000, the National Forest Policy of 1952, 1988, the National Bamboo Mission of 2002, the Green India Mission of 2010, and other significant policy initiatives highlighted the importance of agroforestry in achieving the target of 33% forest cover and sustaining production (Foresta *et al.*, 2013). By publishing recommendations in this respect, efforts have also been undertaken in other states to make it easier to plant trees on homesteads and field bunds. Generally speaking, the policy is designed to address issues like food security, nutrition, employment creation, energy needs, land degradation, soil and water conservation, climate change mitigation and adaptation, market facilitation, and to establish industrial linkages with a primary focus on small farmers (Bijalwan *et al.*, 2019). As of right now, 613 of the 749 management plans that have been created have received approval from the appropriate authorities. Through the use of seminars, conferences, research trips, and training sessions, more than 23,707 farmers have been made aware. For instance, a farmer in the Hosangabad district makes Rs 97,705 a year on 3.05 ha of land (Kumar *et al.*, 2012).

**National Agroforestry Policy, 2014**

The World Congress on Agroforestry, which had the theme "Trees for Life," was held in New Delhi in February 2014 to look ahead to potential barriers to the adoption of agroforestry practices.In addition to those communities who have historically used some type of agroforestry system, the NAP, 2014 is meant to honor the experts who have dedicated half a century to study and documentation, making agroforestry an integrated science. Additionally, NAP, 2014 is a trailblazer in altering the lives of the rural agricultural community, safeguarding ecosystems, and guaranteeing food security through sustainable ways through the use of agroforestry (Lorenz *et al.*, 2014).The creation of a National Agroforestry Mission/ Board under the Department of Agriculture and Co-operation (DAC), Ministry of Agriculture, GoI, and the upgrading of NRCAF, Jhansi as a nodal center with regional centers based on agroecology in various parts of the country are proposed as ways to accomplish this goal. This action will support the development of the agroforestry value chain, climate-resilient technologies, and region-based marketing connections. The Policy also recommends extensive outreach initiatives to disseminate the findings of intense agroforestry R&D projects (Rudebjer *et al.*, 2006).

**India's area covered by agroforestry**

Even though agroforestry is practiced in many areas of the nation and has been adopted by farmers in various agroclimatic zones, periodic estimation and monitoring of the area under it is still a difficult task due to the lack of a consistent methodology used by the various agencies (Ramanan *et al.*, 2022). The approximate area now covered by agroforestry is projected to be 25.32 million hectares (ha), or 8.2% of the entire country's geographic area. According to information from the CAFRI, Jhansi, and Bhuvan LISS III, there are 13.75 million hectares of agroforestry (Dhyani *et al.*, 2020). It will also be a difficult challenge for research organizations to fine-tune the area for a certain agroforestry system, such as agri-silviculture, silvi-pasture, agri-silvi-horticulture, traditional systems, or area under a particular tree-based system. The development of digital signatures for all significant agroforestry tree species can help achieve this (Chavan *et al.*, 2015).

**Public-private partnership (PPP)**

Agroforestry has grown in areas with private sector support, such as Tamil Nadu where effective models like pulp and paper factories have been developed (Tamil Nadu Newsprint Ltd). There are several wood-based industries located in the Indo-Gangetic area. These include WIMCO Ltd., plywood factories located in Haryana, Punjab, Uttarakhand (Rudrapur), Odisha, and Gujarat (JK Paper Mills), and the West Coast Paper Mill located in Uttar Pradesh. In addition, Jharkhand's Chhattisgarh produces gums and resins, Madhya Pradesh produces tendu, North East India is known for cardamom production, and Keralan home gardens are examples of regionally distinct agricultural practices. These industries have discovered connections for marketing with farmers through temporary farming (Ajit, 2013). By doing so, it will be possible to explore the enormous potential of Public-Private Partnership (PPP) in the production and delivery of high-quality planting materials, land development operations, farm produce buy-back schemes, research and extension activities, etc., in the development of agroforestry as envisioned in the policy (Hazarika *et al.*, 2023). The pulp and paper

industries' requirement to meet the demand for paper mills is driving the growth of commercial agroforestry. Approximately 2.5 million hectares of land are needed by the pulpwood plantation sector to fulfil the demands of paper mills (Kulkarni *et al.,* 2013).

**Contribution of agroforestry to ecosystem services**

India has a rich history of cultivating trees around houses and fields, which has played a significant role in shaping the ethos of its people. Across the diverse agro-climatic zones of the country, there are many traditional agroforestry systems, unique to each region, that are deeply rooted in local culture and religion. These systems primarily focus on the subsistence activities of the people and have been passed down from generation to generation (Dhyani, 2020). Home gardens in Kerala and North East India, the Kangeyam tract in South India, the Khejri-based system in the Northwest, the Acacia nilotica-based system in the Central regions, and the Alder-based system in the Himalayas are all examples of these systems. Traditional systems are a great example of how ecosystem services can provide a range of products and services (Chavan *et al.,* 2015). These systems help preserve the soil by reducing erosion and improving its fertility. They also provide clean water for domestic use and livestock, as well as resources like fuel and lumber for building and energy purposes. Moreover, customary crops are grown alongside these resources, ensuring food security (El-Ramady *et al.,* 2014). The land-use systems mentioned below show the relative efficiency of soil loss (kg/ha) in each of them: rained agriculture, horticulture-based agroforestry (145 kg/ha), forest-based agroforestry (74 kg/ha), and cardamom-based agroforestry (30 kg/ha). Among these, cardamom-based agroforestry causes the least amount of soil loss (477 kg/ha) (Kumar *et al.,* 2014). Agroforestry systems can bring several benefits such as protecting soil erosion, producing bioenergy, fixing carbon, creating tree-diverse agricultural landscapes, and offering sustainable land management techniques. These systems also provide natural pest control and habitat for biological diversity. The farmers in the country need to understand the potential and expertise of agroforestry and work towards making it economically and environmentally viable for global farmers (Singh *et al.,* 2021).

**Gaps in the National Agroforestry Policy**

From a broader standpoint, the Policy has focused on general aspects of convergence and collaboration across various departments. Such a manual should contain standard silvicultural practices, including nursery and field procedures, harvesting recommendations, market information, and other extension activities. In short, drafting a comprehensive guidebook is a crucial requirement. For the 20 recognized species at the national level (Tewari *et al.,* 2021). To exclude agroforestry tree species from onerous regulatory regimes, it is crucial to ensure consistency in land tenure and tree species across all states. However, achieving this goal is a challenging task that requires the confluence of interests of several involved parties and the development of consistent legislation in every state (Kajal *et al.,* 2015). One such approach is the agroforestry system's ecosystem services (PES), which will bring together suppliers and customers of environmental services. However, it remains unclear who will be the seller in this case. Additionally, identifying buyers for these services could be challenging and may require some time (Chavan *et al.,* 2015). The Regulation should have provided recommendations to revive and replicate such long-lasting and proven networks that are quickly disappearing. This is especially important in the Northeastern states of Sikkim (Parihaar *et al.,* 2015).

## CONCLUSION

The Policy aims to increase the adoption of agroforestry by outlining specific measures. Its objective is to change the perception of agroforestry and eliminate any obstacles that restrict its potential. By doing so, the Policy guidelines will act as a catalyst for change, helping to guarantee food security, proper nutrition, and cleaner energy. Furthermore, it will provide more job opportunities and sustainable livelihoods, especially for small-scale farmers. However, the main challenge is to implement these guidelines and translate them into action on the ground. In short, a new paradigm needs to be included in the intersectoral design of flagship projects, and the efforts that will help bring about a second revolution- evergreen India's revolution.

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