Policy Brief on

Mainstreaming Agroforestry

18-19 September, 2025

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Background and Rationale

Agroforestry is increasingly being mainstreamed globally as a land-use system that integrates trees in the farming systems to enhance productivity, profitability, diversity, and ecosystem sustainability. Agroforestry significantly reduces the risk of climate change and makes the environment more sustainable to humans, livestock and agriculture. The natural forest cover in most of the countries is decreasing, and hence, promoting agroforestry is the only effective way to increase the green cover. Globally, about 1.2 billion people practice agroforestry on about 10 per cent of the total agricultural cover, comprising over 1 billion ha, and depend upon its products and the ecosystem services.

In India, around 28 mha area is presently covered under agroforestry. Thus, planting trees through agroforestry is the way to —compensate the lost forest cover; provide the benefits that otherwise will be obtained from already over-exploited forests; increase environmental sustainability; enhance the production of food (fruits and vegetables), fodder, fuel wood, gum, resins, and timber; reduce soil erosion and desertification; assist in rehabilitation of degraded lands; enhance soil organic matter; remove atmospheric carbon through sequestration; support biodiversity and provide many other social, religious, and aesthetic benefits. Agroforestry also reduces farmers' risks due to crop failure.

India was the first to come-up with National Agroforestry Policy (NAP) in 2014 with the establishment of Sub-Mission on Agroforestry having an allocation of USD 146.3 million. The policy removed regulatory barriers for growing, felling and transporting 650 agroforestry species in 25 Indian states and Union Territories. Agrofrestry, having been integrated with Corporate Social Responsibility (CSR) initiatives, has attracted significant private investment - about USD 3.5 billion for tree planting in the last one decade. As a result, government forests provide less than 4 per cent of industrial timber, while agroforestry sector meets nearly 90 per cent of industrial demand, demonstrating

the policy's strong impact on our national timber supply.

Globally, agroforestry is recognized as the ultimate approach to enhance the resilience to climate change and reduce the carbon footprint of the developmental activities. To achieve their Intended Nationally Determined Contributions (INDCs), 189 countries submitted an INDC mentioned mitigation as measure to climate change, but only 134 of them mentioned adaptations while India chose to pursue both. Several tree-centric initiatives have been taken globally especially in the developing countries.

Challenges

Despite the fact that several global, national and state level programs of tree plantations have been initiated and technological knowhow are available but the adoption of agroforestry at a desired scale is still not taking place. The inconsistencies across states and a lack of inter-ministerial and inter-departmental coordination hinder effective implementation of the programs and policies including National Agroforestry Policy. The policy bottlenecks regarding growing, felling, and transportation of agroforestry species in certain regions persist. Strict regulations and legal restrictions on harvesting and transporting trees planted on farmlands hinder the adoption of agroforestry.

The mandate of agroforestry falls under the purview of various ministries, departments, and state governments: (i) the Ministry of Environment, Forest and Climate Change focuses on the regulatory aspects, such as issuing guidelines and model rules for the felling and transportation of agroforestry tree species grown on non-forest/private lands; (ii) the Ministry of Agriculture and Farmers Welfare (MA&FW) monitors the Sub-Mission on Agroforestry: (iii) NITI Aayog, the government's policy 'think tank' launched the Greening and Restoration of Wasteland (GROW) with agroforestry initiative to use remote sensing and GIS for mapping potential agroforestry areas and restoring the degraded lands; and (ii) the Ministry of Rural Development through the Department of Land Resources handles the National Watershed Management program to develop degraded and rain-fed areas by treating watersheds in an integrated manner where agroforestry also plays important role in soil and water conservation.

There are inconsistencies across states creating diverse problems but are not widely known to the farmers. Therefore, the issues of convergence and collaboration among different departments and ministries need to be addressed. The entire agroforestry mission must be under the Ministry of Agriculture & Farmers' Welfare for

smooth implementation of policies and programs. It must not be based on tree alone but tree-crop-livestock including fish culture must be dealt under agroforestry. Despite increased investment by Department of Agriculture & Farmers' Welfare (DA&FW), adequate financial allocations in government schemes are still lacking to fully realize the potential of ecosystem services envisioned by the agroforestry policy.

Other constraints for adoption of agroforestry include size of land holdings and ownership/tenancy issues, rules relating to harvesting timber, transportation cost, long gestation period of trees, etc. Also, the research results relating to agroforestry do not reach the farmers in time due to weak extension system. Awareness is lacking on the ground, with farmers sometimes fearing that too many trees on the farm may lead to change in land use. Also, there is shortage of quality planting material.

Opportunities

Despite the challenges, India has ample opportunities to scale-up agroforestry to mitigate climate change, enhance income and improve both livelihood of farmers and soil health condition. The sector can significantly contribute to meeting the growing demand for industrial timber, reducing reliance on natural forests. Research in elite germplasm identification and varietal development can further help improve productivity and economic viability of agroforestry systems. India has numerous traditional tree-based land use systems which can be scaled. The home-gardens, agri-silviculture, silvi-pastoralism and others are time-tested community-based agroforestry systems.

India possesses an exceptionally large linear infrastructure network, providing a vast potential area for tree plantations. The country's transport network includes an estimated 6.7 million km of roads, including around 146,000 km of National Highways and Expressways – of which approximately 6,000 km of expressways are operational and another 11,000 km are under construction, as well as 180,000 km of State Highways, and extensive network of rural and urban roads. Additionally, the country maintains approximately 135,000 km of railway track and nearly 20,000 km of navigable canals and rivers. Together, these interconnected corridors represent a vast area with significant potential for targeted tree planting and landscape-scale greening.

Globally agroforestry is recognized as a mechanism to enhance carbon sequestration and reduce the carbon footprint. Several initiatives, such as the UN Convention to Combat Desertification (UNCCD), the G20 Global Land Initiative, the UN Decade

on Ecosystem Restoration, and the Great Green Wall Program (in Africa and China), along with national programs like the National Action Plan to Combat Desertification, the Integrated Watershed Management Program, and the National Green India Mission, were implemented to arrest desertification and mitigate climate change. Agroforestry played a significant role in these efforts, resulting in the successful establishment of about 28.427 mha under agroforestry practices in India. This can further be doubled in the next one decade.

To meet the national commitment of GHG reduction, as per Paris Agreement, there is potential for creating additional sink of 2.5–3.0 billion tons of carbon dioxide equivalent by 2030 *vis-à-vis* United Nations Convention to Combat Desertification (UNCCD) target of reclamation of only 26 mha of wastelands.

To meet international obligations to mitigate climate change, the "4 per Thousand" aspiration proposed during the 21st Conference of Parties (CoP21) in Paris aimed at agricultural solution to address climate change by increasing soil organic carbon (SOC) by 0.4 per cent per year. India pledged to achieve the Land Degradation Neutrality Targets of 26 mha by 2030, increase the share of non-fossil fuel based power generation capacity to 40 per cent, as well as create an additional carbon sink of 2.5

to 3.0 billion tons of CO_2 eq. through afforestation. There are 117 million small land holders (SLHs) in the country possessing 85 per cent of the total operational holdings, cultivating over 72 mha of land and meeting more than half of India's food requirement. Soils of these SLHs is very low in SOC (1,370-1,770 Tg C), which can be increased to 2,460-2,650 Tg C by 2050 through large-scale adoption of best practices of cultivation such as conservation agriculture and agroforestry. With these practices we can enhance carbon sequestration by 70-130 Tg CO_2 eq. per annum and can produce 410-440 million tons of food grains accounting for 80-85 per cent of total food requirement by 2050.

About the Consultation

The growing global recognition of agroforestry as a crucial climate change mitigation and adaptation strategy necessitates a comprehensive review and strategic planning for future growth and to leverage India's experience and learning to develop national policies and strategies for accelerating the adoption of agroforestry. In India, despite several initiatives, including viable and vibrant technologies and successful climate-resilient models available, and rich biodiversity, agroforestry has not been adopted to the desired scale and to its full potential. In view of the above, a "National Consultation on Scaling

Agroforestry" was jointly organized by the Trust for Advancement of Agricultural Sciences (TAAS), New Delhi; Indian Council of Agricultural Research (ICAR), New Delhi; ICAR-Central Agroforestry Research Institute (CAFRI), Jhansi; and World Agroforestry Center, (ICRAF), India Office, New Delhi at NASC Complex, New Delhi on 18-19 September 2025. A total of 88 participants representing ICAR Institutes, State Agricultural Universities (SAUs) and other Universities, NGOs, policymakers, researchers, practitioners, the private sector, civil society organizations, and farmer groups participated. The major objectives of the Consultation were to: (i) assess the current status of agroforestry implementation in India, and identify the constraints, challenges, and potential, (ii) identify policy, economic, and capacity-related bottlenecks hindering the wider adoption and scaling-up of agroforestry, (iii) develop a strategic roadmap for scaling-up agroforestry in India, aligning with national development policies and global climate commitments, and (iv) foster collaboration and coordination among stakeholders, including government agencies, research institutions, private sector, NGOs, and farmer communities.

The expected outcomes of the Consultation included identification of major challenges and constraints, and suggestions on: (i) suitable measures for promoting the use of agroforestry, (ii) strategies for strengthening agroforestry research, development, and capacity building along with increased investment, (iii) development of appropriate mechanism for collaboration and coordination among stakeholders, including government agencies, research institutions, private sector, NGOs, and farmer communities, and (iv) development of a road map for upscaling adoption of agroforestry aligning with national development policies and global climate commitments.

The deliberations were made under the well-charted technical program, which included Inaugural Session, Plenary Lecture, Evening Lecture, three Technical Sessions, Parallel Round Table Discussion on building Road Map for the Future in four Working Groups and a Concluding Session.

Recommendations

All stakeholders were unanimous to reaffirm that agroforestry has to be a central strategy for *Viksit Bharat@2047* and India's climate/net-zero pathways. There is need to elevate agroforestry as a core national land-use paradigm — integrated across major missions on agriculture, climate, environment, rural development, and urban planning. Agroforestry needs to be reframed as a holistic production system

combining trees, crops, and livestock, rather than limiting it to the current Trees outside Forests (ToF) category. Also, adoption of agroforestry needs to be promoted in rural, peri-urban, and urban settings as a flagship Climate-Smart Agriculture (CSA) solution that enhances productivity, resilience, carbon sequestration, and ecosystem services.

The following key recommendations emerged based on in-depth deliberations during the National Consultation on Scaling Agroforestry:

I. Enabling Policies

1. It was unanimously affirmed that an aggressive approach is now needed to scale innovations related to agroforestry for which the Ministry of Agriculture and Farmers Welfare needs to create a strong administrative wing headed by a Joint Secretary (Agroforestry) and the current Sub-Mission on Agroforestry and the National Bamboo Mission be unified with additional budget allocation of INR 1,000 crore annually for the next five years. Under the Mission, area be doubled from current 28.42 mha to 57 mha and issues related to revision of guidelines issued on agroforestry by the Ministry of Environment, Forest and Climate Change, land tenure, NTFP regulations, availability of

credit at low interest rates, and the incentives to farmers through carbon credit, etc. be addressed on top priority in the best national interest.

2. The existing National Agroforestry Policy, adopted in 2014; the State Action Plans on Climate Change; and the Agroforestry Guidelines issued in June 2025 by the Ministry of Environment, Forests and Climate Change (MoEFCC) need to resolve inconsistencies, clarify institutional mandates and align them with emerging climate, market, and ecological conditions. These need to reframe strategies with actionable plans with specific, measurable, achievable, relevant and time-bound targets. A clean and well-defined budget allocation must be made for each action plan with a phased implementation road map delineating responsibilities, transparency, time-frame, monitoring mechanism and evaluation criteria.

3. There is an urgent need to have a successful agroforestry carbon finance strategy as an integrated framework centred around incentives, market access, and digital transparency. First, an incentive-based mechanism, akin to REDD+, must provide direct financial rewards and rightful

carbon revenues to farmers for sequestration, making participation economically viable while also protecting biodiversity and ecosystem services. Second, the nation must develop a robust carbon market strategy that fully integrates the agroforestry sector, enabling access to international finance under the Paris Agreement's Article 6 (NDC) and establishing domestic goals *via* programs like Emission Trading System (ETS), Joint Credit Mechanism (JCM), and Voluntary Emissions Reducing (VER) programs. Finally, the structure must be underpinned by an expansion of digital Measurement, Reporting, and Verification (MRV) platforms to improve the transparency and efficiency of generating agroforestry carbon credits, utilizing the data to optimize sequestration models and provide verifiable evidence, thereby increasing credit value and marketability.

4. There is full justification to establish a National Agroforestry Development Board (NADB) under the Ministry of Agriculture & Farmers Welfare, Government of India, as a central coordinating body to accelerate "*Har Med Par Ped*" call by the Hon'ble Prime Minister, with an aggressive agroforestry approach national-wide.

5. The States need to be encouraged to adopt state-specific agroforestry policies, create farm bunds using Vikshit Bharat - Guarantee for Rojgar and Ajeevika Mission (Gramin) Act 2025 (Previously Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) resources, and leverage *Rashtriya Krishi Vikas Yojana* (RKVY)-Agroforestry funds along with carbon markets, climate finance, and Corporate Social Responsibility (CSR) contributions for mission's sustainability.

6. There is an urgent need to have strong agroforestry research coordination mechanism between ICAR, Ministry of Environment and Forests and Defence Research and Development Organisation (DRDO) to ensure convergence and avoid duplication across schemes. Strengthen ICAR-CAFRI, Jhansi with at least 50 research scientists, well trained, and funded to undertake resourced, and empowered Centre of Excellence for national agroforestry research, training, and extension and to effectively coordinate frontline extension, nursery accreditation, monitoring and evaluation of agroforestry programs and serve as a national hub for knowledge generation, dissemination, and policy support.

7. There is an urgent need to increase investments in R&D for genetic improvement of tree crops. This would ensure genetic enhancement, developing much needed robust tissue culture protocols, agroforestry modelling, and developing region-specific agroforestry systems (tree + understory crops + livestock). There is a definite need to increase investment in both public and private sectors for agroforestry research, development and education, and assure investment in establishing value-added chain of small industries in rural areas.

8. Provide specialized insurance schemes for tree-crop combinations, acknowledging longer gestation periods compared to annual crops coupled with accessible credit facilities to safeguard investments by farmers and build confidence. The farm-grown wood and related agroforestry products must be exempted from GST to encourage farmers to invest in agroforestry-based farming systems.

II. Research and Development

9. Evaluate and assess the potential of agroforestry practices with respect to their production potential, profitability, environmental services and adaptability, especially for their resilience to climate change and contributions to reversing biodiversity and soil fertility loss. Explore the cost-effectiveness and efficiency of modern technological tools such as GIS, remote sensing, micro-irrigation and climate-smart conservation agriculture and develop an agroforestry atlas with species suitability maps for different agro-ecological zones.

10. Conduct a comprehensive meta-analysis of both traditional and modern practices to identify fine scale variations across social, economic and ecological contexts. This will determine the conditions under which specific practices are most suitable. Research designs should be structured to assess both successes and failures, providing robust insights to guide the scaling of agroforestry practices effectively.

11. Develop integrated, climate-resilient and market-oriented agroforestry systems ensuring raising of high-value trees with stress-tolerant crops, grasses and legumes and resilient livestock. Microbial consortia must be explored for developing stress-tolerant trees and crops. Indigenous trees, fruits, nuts, potential halophytes and grasses must be domesticated with strong institutional support to rehabilitate degraded lands.

12. Strengthen germplasm conservation systems at the specialised institutions — the field collection of species and their evaluation at ICAR-Central Agroforestry Research Institute (ICAR-CAFRI), Jhansi and tissue culture and cryopreservation and seed conservation at ICAR- National Bureau of Plant Genetic Resources (ICAR-NBPGR), New Delhi.

13. There is an urgent need to strengthen the accredited nurseries for quality planting material (QPM) accessible to the stakeholders. The linkages with research organisations, nursery owners, state departments and farmer-producer organizations (FPOs) to scale-up delivery of quality QPM must be strengthened.

III. Value Chain and Market Linkages

14. Create enabling frameworks including digital marketing intelligence for marketing, branding, certification, and processing of agroforestry products, including timber, non-timber forestry products (NTFPs), fruits, dairy products, and bioenergy. Support storage, cold-chain, and transport infrastructure in rural areas.

15. Promote small-scale agroforestry-based industries for semi- processing and value addition of products and reduce intermediaries to improve farmer income and reduce market risks. For this, a national Market Knowledge Information System (MKIS) must be in place to deliver real-time, transparent information on prices, demand, supply, and trading volumes for key agroforestry species and empower farmers to make informed choices on tree species and intercrops, improve price realization, and enhance the overall commercial viability of agroforestry systems.

16. Launch a dedicated, multilingual National Agroforestry Call Centre under the proposed Mission on Agroforestry for Trees outside Forests (ToF) and agroforestry farming system, accessible *via* basic keypad phones, to provide essential, on-demand support for farmers. The Call Centre may be inter-linked with existing government platforms such as Kisan Credit Card (KCC), Agricultural Technology Management Agency (ATMA), *Krishi Vigyan Kendras* (*KVKs*) and SAUs to ensure region-specific, reliable, and on-demand guidance relating to farm operational know-how and market related information.

17. Establish Public–Private–Producer farmer-Partnerships (PPPPs) to

connect producers with industries (food processing, pharmaceutical, timber) and establish small cottage industries of specific agroforestry products in rural areas involving educated youth, FPOs and women's self-help groups.

IV. Strengthening Extension and Capacity Building

18. There is a need to strengthen private extension system involving youth through capacity-building framework at SAUs to promote and commercialize agroforestry. Also, a dedicated cadre of Subject Matter Specialists (SMS) for agroforestry in all KVKs is highly justified to ensure last-mile technical support to farmers interested in agroforestry.

19. There is a need to demonstrate and replicate successful agroforestry models developed by the research institutes, SAUs, NGOs, and entrepreneur farmers [e.g., WADI model (by BAIF), Poplar-Industry-Farmer partnership (WIMCO-NABARD), etc.

20. Organize targeted training for farmers and field workers on carbon credit initiatives, including an understanding of market rules, monitoring requirements, and the financial structure of the deals.

21. Foster public–private partnerships (PPP) with industries and financial institutions (e.g., NABARD) to support value-chain development and contract farming arrangements to promote agroforestry.

22. It is necessary that SAUs reorient their course curricula to include agroforestry practices so as to create interest among agricultural graduates to embrace agroforestry and become successful entrepreneurs.
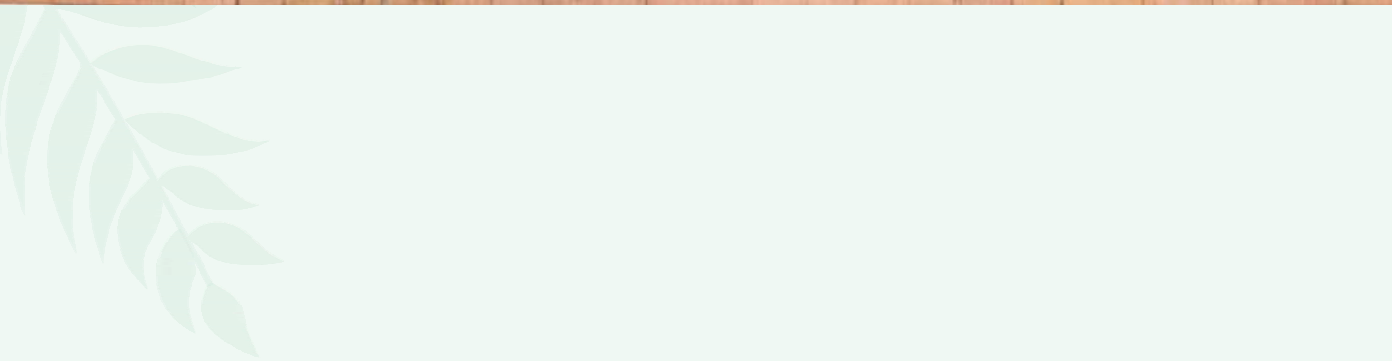
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