



### Brief: Story of change

# The success of a national agroforestry policy in India has become a model for other countries

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## Key messages

- This brief looks at ICRAF's support to develop the National Agroforestry Policy (NAP) in India, and how the policy became a model for similar efforts in other countries.
- Launched in 2014, India's NAP modified regulations, making it easier to cut trees and transport timber on farmland. In addition, a programme with a \$146 million budget was set up to promote agroforestry at the state level and simplify farming practices.
- The NAP enhanced research and innovation through its central role in transforming the National Research Centre in Agroforestry to the Central Agroforestry Research Institute (CAFRI). ICRAF and CAFRI collaborated to train farmers, including women, in agroforestry techniques to help put the NAP into action. In the decade between 2011 and 2021, India increased its tree cover by 490,400 ha. Meanwhile, by 2023, agroforestry was active on 8.65% of the country's land.
- Drawing on its experiences in India, ICRAF supported several other countries in Asia and Africa to develop their own national agroforestry policies. Such efforts with Nepal, Rwanda, Ethiopia, and others, promoted sustainable agriculture and environmental conservation globally.

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## Introduction

Agroforestry – the practice of growing trees alongside crops – has a long history in India. In the north, for example, the practice is known as “Kheti-Wadi”. Apart from providing wood and making land more fertile, agroforestry helps conserve soil, moderate climate, and increase the income of farmers.

In 2013, agroforestry covered about 25.32 million ha or 8.2% of India’s land (Dhyani et al. 2013). It provided over 60% of India’s timber (valued at \$25–30 billion). It also sequestered at least 5–6 tonnes of carbon annually. Despite the socioeconomic and environmental benefits of agroforestry, only certain areas of India have adopted the practice. Moreover, even in these areas, agroforestry has not reached its full potential.

Various technical, financial, and regulatory obstacles have prevented scaling up the practice. On the technical side, no single ministry was in charge of agroforestry, which led to insufficient attention and support. At the finance level, institutions found it difficult to place agroforestry within either the agricultural or forestry sector. Meanwhile, strict regulations on cutting trees and transport of timber also impeded its expansion. Finally, import policies and bans on sawmills discouraged farmers from agroforestry and damped the market for non-farm timber.

Given its desire to overcome these obstacles, India began developing a National Agroforestry Policy (NAP) with extensive input from the World Agroforestry Centre (ICRAF), the Ministry of Agriculture, and other stakeholders (Figure 1).

## Setting the stage

When India began developing its NAP, it drew on almost three decades of previous policy and research efforts. In 1983, the Indian Council of Agricultural Research (ICAR) established 20 centres across the country to coordinate research on agroforestry. Five years later, India set up the National Research Centre for Agroforestry (NRCAF).

On a parallel track, ICRAF – also known as the International Centre for Research in Agroforestry – established an office in New Delhi in 2003. ICRAF and ICAR developed a five-year plan to work with farmers and communities in the field. At the same time, they supported research in national institutions and universities, and within non-governmental organizations (NGOs).

## Gathering evidence

In 2008, building on the work of ICRAF and ICAR, the Ministry of Agriculture and Farmers Welfare (Department

of Agriculture, Cooperation and Farmers Welfare) began to explore the merits of a NAP. Working alongside ICRAF, NRCAF, and other stakeholders, the ministry analysed all its various policies related to agroforestry ranging from agriculture and farmers to forests and water. They also looked at how other countries were addressing these issues.

Based on this analysis, India clearly saw the benefits of a coherent national policy for agroforestry (Singh et al. 2016). To further build the case, policymakers sought additional input from industry experts, technical specialists, and financial sectors. These discussions cemented the convictions of the Indian government for a NAP.

Between 2008 and 2014, with the ministry, ICRAF organized 13 national consultations, roundtables, and meetings that explored the potential directions for a NAP. The process engaged representatives from both central and state governments, as well as NGOs and civil society organizations. Industry, financial institutions, donors, CGIAR Centres, universities and other research institutions also took part.

In December 2013, ICRAF was formally included in the NAP drafting committee. It joined NRCAF; the Department of Cooperation (DAC); Ministry of Agriculture; ICAR; the Planning Commission; state governments, industry; NGOs; Ministry of Environment and Forest (MoEF), now Ministry of Environment, Forest and Climate Change (MoEFCC); Department of Land Resources (DoLR), Ministry of Rural Development; and the National Bank for Agriculture and Rural Development (NABARD). In addition, relevant government offices offered expertise.

Throughout this inclusive process, NRCAF and ICRAF took the lead on technical issues. However, other stakeholders also made important contributions. For example, DAC provided insight into how agroforestry would respond in diverse agroclimatic zones. It also analysed laws and policies in India relating to agroforestry.

## Endorsement and evolution

The journey to a NAP culminated in February 2014. On 10 February, Mr. Pranab Mukherjee, President of India, formally launched the policy at the 3rd World Congress on Agroforestry. Shortly afterwards, on 21 February, the policy was placed on the floor of the Upper House of Parliament of India, which formally closed the process (Parliament of India 2014).

The policy aims to address bottlenecks in scaling up agroforestry and remove barriers to adoption at scale. To that end, it seeks to increase productivity and cater to the increasing demand for timber,



food, and non-timber forest products. The policy also supports achieving India's goal of national tree cover to 33%, contributing to its Nationally Determined Contribution (NDC). With overarching goals to improve the livelihoods of farmers, food and nutrition security, and protecting ecosystems, it also promotes convergence and simplified regulations on harvesting and transportation of trees grown in agricultural landscapes.

As part of its continued evolution, NRCAF transformed into the Jhansi-based Central Agroforestry Research Institute (CAFRI) in 2014. As the NAP moved into an implementation phase, ICRAF, CAFRI and other partners continued to research agroforestry in both India and globally. This research, shared with NAP through journals, books, guides, and extension materials, covered a range of areas, including emerging agroforestry tree species and models for different agroecological zones in India; how to produce quality planting materials; sustainable development through farm trees; use of perennial tree germplasm resources in global genome sequencing; and climate-resilient

agroforestry systems (Chaturvedi et al. 2017; Handa et al. 2020; Arunachalam et al. 2023; Handa et al. 2019; Singh et al. 2024).

ICRAF, CAFRI, Tamil Nadu Agriculture University, and the Indian Society of Agroforestry, among others, supported both formal and informal training for individuals and institutions. In all, they helped organize 20 training sessions at the international level, as well as 16 national ones. More than 600 scientists, practitioners, development partners, government staff, and policymakers benefited from these sessions.

The training covered various areas. On the technical side, trainees enriched their knowledge of geo-informatics, research methods, soil-plant spectroscopy; ecosystems and carbon sequestration; and climate-resilient agriculture. Sessions were also held on gender sensitization and research in agroforestry. Finally, best practices for using agroforestry in different agroecological zones were shared. In addition, 25,268 farmers, extension agents, and local resource persons were trained in various aspects of agroforestry. Women represented more than one-third (35%) of these trainees.





## Outcomes

**Strengthened coherence:** Following the NAP, agroforestry became officially housed within the Ministry of Agriculture. As agriculture falls under state jurisdiction, the NAP was instrumental in encouraging states to ease up restrictions on felling and the transport of tree species usually grown through agroforestry. These measures encouraged farmers to adopt and/or expand agroforestry.

**Regulatory reforms:** The policy has led to significant reform of regulations. As well as making it easier to fell trees and transport species grown on non-forest private lands, the policy has led to exemptions for bamboo grown on private lands. These changes have enabled farmers to integrate trees into their agricultural practices more readily, encouraging adoption of agroforestry.

**Significant funding:** Following the policy's launch, the Government of India invested \$146 million to support agroforestry schemes through a Sub-Mission on Agroforestry (SMAF). These funds have helped drive states to ease restrictions on tree felling and transport. As noted, this has encouraged take-up of agroforestry practices (DA & FW 2016).

**State-level policies:** Numerous states have worked with partners to develop their own agroforestry policies. For example, ICRAF is leading a consortium of seven states to mainstream agroforestry into their policy landscapes. The initiative, "Trees Outside Forests in India", is jointly implemented by the United States Agency for International Development (USAID) and Ministry of Environment, Forest and Climate Change (MoEF&CC). In 2023, the Krishi Vikas Yojana (RKVY-National Agriculture Development Plan) also proposed an agroforestry component that focuses on Quality Planting Material (QPM) production. This is supported by a proposed budget of \$54 million, including investment by the state (DA & FW 2023).

**Research and development:** As noted, NRCAF evolved into CAFRI in 2014. This shift was, in part, to support research and development in agroforestry, and encourage innovation (ICAR-CAFRI 2015). Meanwhile, SMAF has created 327,350 nurseries (NMSA n.d.) to respond to the shortage of QPM.

## Impacts

**Tree cover:** Tree cover has grown from 9.08 million ha to 9.57 million ha in the decade between 2011 and 2021 (FSI 2021). The most recent report of the Food and Agriculture Organization in July 2024 acknowledges the role of the NAP of India in catalysing 2.66 million ha of forest area annually from 2010 to 2020. This secures India in the third spot among the top 10 countries with the most significant forest area gains during this period (FAO 2024).

All told, agroforestry is now practised on 28.42 million ha (DA & FW 2023), covering about 8.65% of India's geography. This expansion indicates that Indian farmers have begun to embrace agroforestry and integrated it into their farming practices (Arunachalam et al. 2022).

**Farmers' livelihoods:** With the NAP in action on the ground, land use has significantly increased. It has also helped diversify income for farmers, improve management of natural resources, and make fuel, fodder, and timber more available. All these impacts have helped transform the lives of farmers.

**Climate change:** The NAP has strengthened the Government of India's efforts to fight climate change and achieve its NDC. The policy has transformed the country's forestry and agricultural sectors, pointing the way towards reducing the emission intensity of its GDP by 45% from 2005 levels by 2030. This will be achieved by creating additional carbon sinks of 2.5–3 billion tonnes of CO<sub>2</sub> equivalent through increased forest and tree cover (Government of India 2022). As of 2019, India had reduced its emission intensity of GDP by 33% over 2005 levels. The original target was achieved 11 years ahead of schedule (MoEFCC 2024).

**Timber:** Agroforestry now meets about 63% (Shrivastava and Saxena 2017) of timber needs in India. It also delivers about 90% (Pandey and Roy 2020) of the raw materials needed for sawmills, ply and veneer mills, paper mills, and other industries. Various studies have shown how the NAP can take partial credit for this success.

**Economy:** Not surprisingly, agroforestry has helped boost the supply of industrial timber. Industry needs at least 62 million m<sup>3</sup> of timber from agroforestry; it receives around 74.5 million m<sup>3</sup> (FSI 2021). Corporations attracted to agroforestry for its economic and environmental benefits invest \$3.5 billion in the sector annually (MoEFCC 2023).

## Inspiring other jurisdictions to develop a NAP

India's development of a NAP in India sparked significant regional and global ripple effects, influencing agroforestry development across various countries and regions. Leveraging the expertise of ICRAF and other international partners, numerous nations have initiated or enhanced their agroforestry policies and strategies. This has helped create a global movement towards sustainable land-use practices.

**ASEAN:** The Association of Southeast Asian Nations (ASEAN) developed guidelines for agroforestry

development in concert with ICRAF and the Food and Agriculture Organization of the United Nations (FAO) (ASEAN Secretariat 2018). These guidelines suggest a path for integrating agroforestry into national and regional policies. In so doing, they promote sustainable agriculture and environmental conservation across the region.

**Nepal:** In 2014, supported by ICRAF, Nepal launched a NAP process that drew on the process recently completed by India. In addition to national consultations, Nepal took part in regional workshops. In 2017, a study group from Nepal travelled to India to meet with policymakers and scientists to understand their process for developing a NAP. In 2019, Nepal became the second country to launch a NAP (MOALD 2019a; MOALD 2019b). Supported by ICRAF, Nepal's policy seeks to leverage the benefits of agroforestry to manage land more sustainably, improve livelihoods, and strengthen environmental resilience.

**Africa:** With support from ICRAF and other partners, several countries in sub-Saharan Africa analysed the challenges and opportunities involved in expanding agroforestry. Rwanda completed an action plan for agroforestry for 2021–2022, presenting strategic options for the integration of trees into farming systems. For its part, The Gambia's National Agroforestry Strategy in 2022 stressed the contribution of agroforestry to support climate resilience and sustainable agriculture (MECCNAR 2022). Ethiopia and Kenya have also shown interest in developing agroforestry policies or strategies.

**Central America:** Building on the experiences of other countries, Belize is developing its own NAP (CTCN 2020). Meanwhile, ICRAF is supporting the Maldives to develop its NAP, which seeks to make land use more sustainable within its ecosystems.

## Lessons learned about overcoming barriers

### Leverage strengths of different ministries for greater impact

In principle, agroforestry falls under the umbrella of agriculture and forest ministries in most countries. Often, however, because of its cross-sectoral nature, agroforestry can fall through the cracks instead. In India, lack of coordination and convergence was compounded by an inability to leverage resources, and the struggle to assign agroforestry to the most relevant and suitable departments within these ministries.

Policies and laws often worked at cross purposes, sometimes adversely affecting tree plantation and agroforestry. In India, the agriculture sector wanted to de-notify the highest number of tree species possible

by relaxing restrictions for felling and transport through the Forest Law. For its part, the forestry sector was reluctant to remove these protections too quickly.

In India and much of South Asia, agroforestry typically takes place on private land. Because farmers depend on extension services and inputs such as seeds and fertilizers, they are often linked with the agriculture ministry. Consequently, this ministry is better suited to work with farmers. It can draw on a vast network of extension workers, as well as Krishi Vigyan Kendras (Agriculture Science Centres) in every district.

In many countries, the agriculture ministry has more capacity than the forest ministry to produce and coordinate QPM of agroforestry species, which is in short supply. However, the forest ministry has a well-established network of nurseries that produce seedlings of major tree species used in forestry. Therefore, both together can address this challenge in a complimentary mode.

Most of these nurseries typically produce tree seedlings for rehabilitating and planting new forests. However, they can be easily turned into facilities that produce tree species needed by both forestry and agroforestry. In the interests of all concerned, both ministries need to leverage their strengths and comparative advantages rather than compete with each other.

A similar dilemma occurs for state governments: which ministry or department should be the focal point for agroforestry? The NAP has been shown to be an effective model for discussing such issues and resolving the challenges.

### Transfer national lessons to other jurisdictions

States in India harnessed lessons learned from the NAP to develop their own agroforestry policies. Nepal did the same. In this way, India's NAP has helped build a groundswell of interest in other jurisdictions in the multifaceted benefits of agroforestry.

### Build solid partnerships

Throughout the process, ICRAF was both a source of knowledge and neutrality. As a non-partisan partner, it was able to step outside jurisdictional debates, and focus solely on national interests. Despite its small number of staff in India, ICRAF added value to the NAP policy process and its implementation.

In addition to ICRAF, relevant national institutions include ICAR-CAFRI, ICAR-Indian Institute of Soil Science, ICAR-Central Arid Zone Research Institute, ICAR-Indian Institute of Horticulture Research, ICAR-National Bureau of Plant Genetic Resources, and Odisha University of Agriculture Technology.

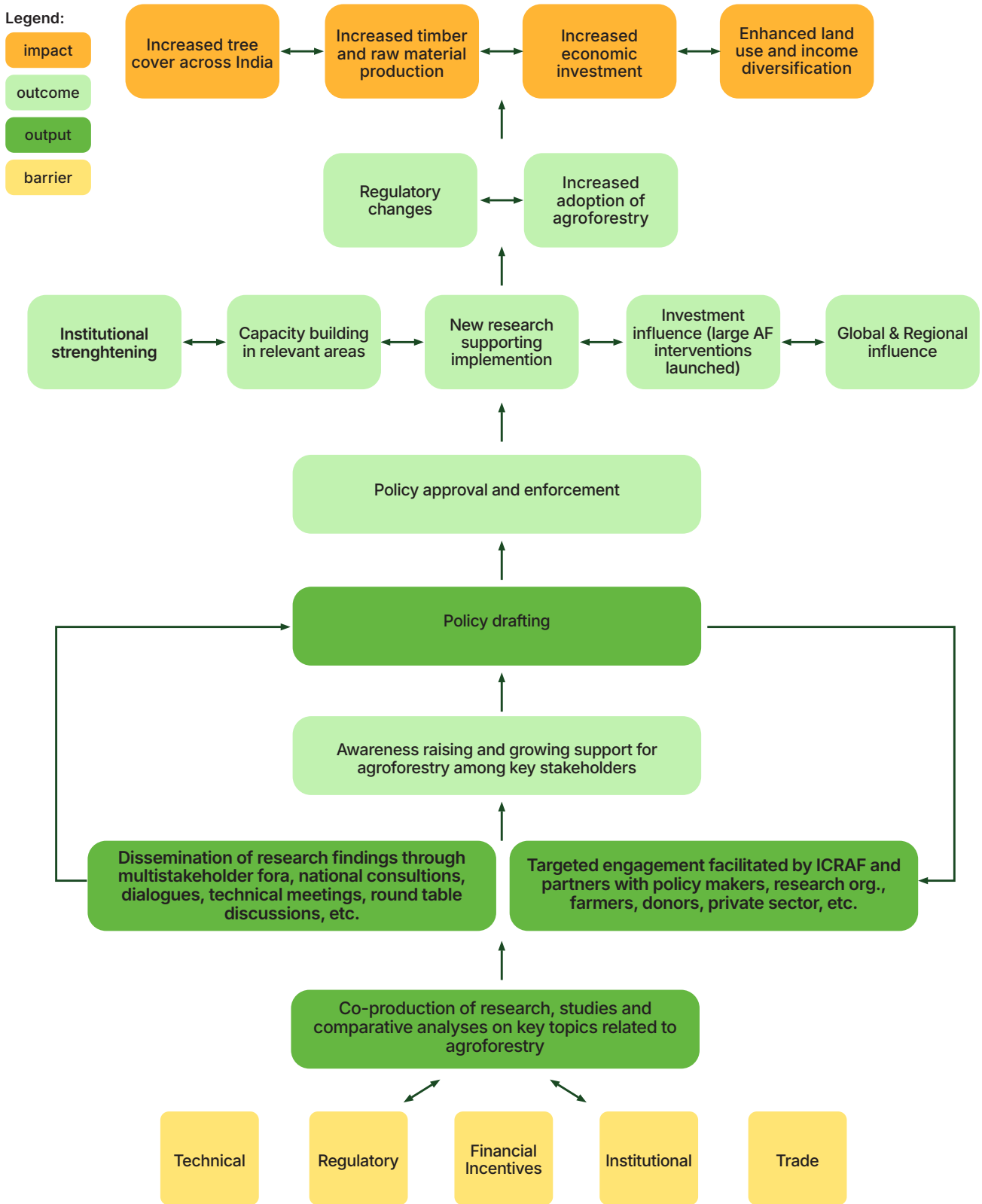


Figure 1. Theory of Change

## Conclusion

Thanks to the development and implementation of a NAP, India has sped up adoption of agroforestry, and generated desired impacts. A participatory process enabled the NAP to overcome challenges inherent in developing a coherent policy. Its success has influenced many countries to pursue similar efforts.

The role of ICRAF and its partners has been instrumental in these policy developments. This underscores the importance of technical partners to foster effective agroforestry policies and practices. Following the merger with CIFOR, CIFOR-ICRAF has continued to collaborate with the Government of India through its Ministry of Agriculture and Farmers Welfare. For its part, ICAR helped implement the SMAF, which has been so pivotal to the success of the NAP.

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