

NATURE-POSITIVE SOLUTIONS: INDIA



INITIATIVE ON
Nature-Positive
Solutions

The CGIAR Nature-Positive Solutions had several successes in India. Most of the Initiative's key activities happened in tribal areas in Maharashtra State. As with much of NATURE+'s work – particularly on neglected and underutilized species, or NUS – traditional knowledge was key to the Initiative's activities on crops, trees and nature-positive agriculture in India. The Initiative's highlights included launching a national hub for circular bioeconomy, supporting traditional seed banks, and integrated watershed management systems. This report covers NATURE+ activities in India, which set the stage for continuity in the CGIAR Research Portfolio 2025-2030.

The image below is part of a collection of artworks created by the Lexicon that captured the Initiative. Here, women prepare seeds for storage. Image: Alberto Miti, The Lexicon. Non-commercial use allowed with attribution.



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What is Nature-Positive Solutions' vision?

The CGIAR Nature-Positive Solutions Initiative (NATURE+) was established to reimagine and implement innovative, scalable, and locally relevant solutions that enhance biodiversity, regenerate landscapes, and ensure sustainable food production. Through five work packages – **CONSERVE, MANAGE, RESTORE, RECYCLE** and **ENGAGE**, uniquely designed to be simultaneously deployed at research sites – the Initiative aims to help shift agriculture from being a driver of environmental degradation to becoming a net-positive contributor to nature. Through cross-sectoral collaboration, research, and community-driven interventions, NATURE+ integrates conservation, restoration, circular bioeconomy practices and policy science to create resilient agri-food systems.

Across all five countries, the NATURE+ Initiative is transforming food systems by promoting biodiversity, regenerative agriculture, and circular economy solutions. Each country's activities are tailored to its specific environmental, economic, and social challenges, but together, they create a global model for nature-positive agricultural transitions. The initiative demonstrates that agriculture does not have to come at the expense of nature, but instead, can be a force for ecosystem restoration, climate resilience, and sustainable livelihoods.

At the heart of NATURE+ is a commitment to fostering equity and inclusivity by empowering local communities, Indigenous peoples, women, and youth to lead sustainable food system transformations. By leveraging both traditional knowledge and scientific advancements, NATURE+ is creating pathways for regenerative agriculture, soil health improvement, agrobiodiversity conservation, and sustainable livelihoods across diverse landscapes. NATURE+ had almost 300 partners and stellar collaboration between CGIAR centers – Alliance of Bioversity International and CIAT, International Water Management Institute, International Potato Center, International Center for Agricultural Research in the Dry Areas, and the International Food Policy Research Institute.

What issues does NATURE+ address?

The global food system faces pressing challenges that threaten ecosystems, food security, and human well-being. NATURE+ worked to address the following key challenges:

- **Biodiversity Loss:** Agricultural expansion and monocultures have led to the loss of native species, reduced ecosystem resilience, and decreased agricultural productivity. The initiative promotes tree-based restoration and conservation of native crops to counteract this trend.
- **Land Degradation:** Unsustainable farming practices and climate change exacerbate soil erosion, loss of fertility, and desertification. NATURE+ focuses on soil health restoration and nature-positive farming methods to reverse degradation.
- **Food and Nutrition Insecurity:** While food production has increased, nutritional diversity has declined, leading to malnutrition and diet-related health issues. NATURE+ integrates neglected and underutilized species (NUS) into food systems to improve dietary diversity and resilience.
- **Climate Change:** Unpredictable weather patterns, prolonged droughts, and floods are affecting agricultural productivity. The initiative supports climate-resilient farming techniques, water management, and tree planting for carbon sequestration.

- **Circular Bioeconomy Gaps:** Agricultural waste is often underutilized, leading to environmental pollution. NATURE+ promotes bio-based solutions such as composting, biochar production, and biogas generation to close resource loops and enhance sustainability.
- **Lack of Inclusive Policy Support:** Many countries lack enabling policies for sustainable agriculture and nature-positive solutions. The initiative works with governments and stakeholders to integrate nature-positive strategies into national policies and action plans.

India: specific challenges

India's growing support for nature-positive systems stems from **climate change impacts, soil degradation, and water scarcity**, particularly in **semi-arid regions like Maharashtra**. The Initiative was designed to support **nature-positive farming, integrated watershed management, and agroforestry**. It also focused on **reviving traditional seed banks and enhancing the circular bioeconomy** through the **Circular Bio-Economy Innovation Hub**, which promotes sustainable farming inputs and waste-to-energy solutions. Additionally, the Initiative greatly increased the understanding of native tree species needed to meet reforestation goals in the country.

Key work package highlights

CONSERVE: Established on-farm conservation centers and community seed banks.

MANAGE: Supported community seed banks; worked on sustainable propagation of NUS.

RESTORE: Planted 18,200 saplings across 19 hectares of communal land; developed climate-resilient restoration strategies.

RECYCLE: Established the Circular BioEconomy Innovation Hub; piloted circular models; trained university students on innovation challenges.

ENGAGE: Policy development for circular bioeconomy; studied gender-specific uptake of nature-positive solutions.

India's participation in NATURE+ was marked by a strong emphasis on conservation, sustainable farming, and landscape restoration. **CONSERVE** worked on the establishment of on-farm conservation centers and community seed banks to protect traditional crop varieties and ensure their continued use. **MANAGE** contributed to community seed banks and promoted sustainable propagation of neglected and underutilized species. Additionally, manage studied value chain activities that could be derived from these crops. **RESTORE** initiated a large-scale restoration project, planting 18,200 saplings across 19 hectares in collaboration with local communities and government agencies. **RECYCLE** played a key role in establishing India's Circular BioEconomy Innovation Hub, organizing innovation challenges for students, and training communities on waste-to-resource solutions. **ENGAGE** developed policies to foster circular bioeconomic activity while researching gender-specific adoption of nature-positive solutions, highlighting disparities in agricultural decision-making. Across all work packages, NATURE+ collaborated closely with traditional communities and the BAIF

Research Development Foundation, a key partner for activity implementation. These collaborative efforts helped demonstrate that nature-positive solutions can strengthen India's resilience to climate change while creating economic opportunities, improving soil health, and integrating native biodiversity into national and local restoration programs.

Integrating traditional knowledge with sustainability science

India's nature-positive interventions are significant in mitigating soil degradation, climate change impacts, and biodiversity loss. The Circular Bio-Economy Innovation Hub is particularly innovative, serving as a platform for waste-to-wealth strategies and action, organic farming, and nature-based business models. The Initiative also supports traditional seed banks, helping smallholder farmers access diverse, climate-resilient crops. The establishment of integrated watershed-management systems enhances water retention and soil health, addressing drought vulnerabilities in Maharashtra's semi-arid regions. The combination of scientific research and traditional farming knowledge makes this initiative a pioneering effort in sustainable agriculture. The Initiative and partners established **14 on-farm conservation centers** to the benefit of **hundreds of farmers**. Some **60 demonstration plots** were created to support rice management trials, potentially helping farmers increase the production of their high-value native rice varieties. To improve local agrobiodiversity conservation and sustainable use, NATURE+ trained farmers and supported traditional seed banks and seed systems.

Key significance of results

- Restores **soil health and water security** through **watershed management** and **biochar integration**.
- Strengthens **local seed systems**, reducing dependency on **commercial seed companies**. Additionally, bioinputs reduce dependency further.
- Promotes **women and youth-led agroecological entrepreneurship**, ensuring **economic sustainability**.
- Encourages **exploration of economic opportunities** that go hand-in-hand with conservation of neglected and underutilized species.
- Strengthens **semi-arid rural areas for climate change**, and creates a model for how **nature-positive solutions are a valid climate-mitigation tool**.

India's nature-positive future shows much promise

India's increasing focus on conservation, circular economy innovation, and large-scale reforestation points to a positive nature-positive future. Community seed banks have been expanded, and gender-specific uptake of nature-positive solutions has been studied. Innovation hubs support bioeconomy startups, and restoration projects across communal lands demonstrate how scientists, communities and agencies can successfully collaborate. India's strong support for nature-positive research is also an encouraging sign. NATURE+ scientists envision scaling their work in India as part of the CGIAR Research Portfolio 2025-2030.

Research will increasingly focus on the landscape scale, while still serving individual farmers and their communities. Future work will likely scale conservation programs, expand circular bioeconomy training, and integrate restoration with climate adaptation strategies. Work will continue on sustainably using and conserving neglected and underutilized species, and developing value chains based on these crops. Digital tools will support seed banks and reforestation efforts. Continued research on sustainable farming practices, particularly in tandem with traditional farmers, will improve food security and soil health while strengthening biodiversity conservation.

Publications and further reading

The following is a brief list of key published highlights from NATURE+. For comprehensive lists, please view the work package reports [CONSERVE](#), [MANAGE](#), [RESTORE](#), [RECYCLE](#) and [ENGAGE](#).

Additionally, readers can review the majority of NATURE+'s 370 outputs, outcomes and other advances between 2022-2024 on the [CGIAR Results Dashboard](#).

Also, the [NATURE+ repository on CGSpace](#) contains more than 300 items.

Publications

Measuring Above-Ground Carbon Stock Using Spatial Analysis and Allometry - [Read here](#)

Circular bioeconomy business models - recovering food products to reduce agricultural waste: cases from Burkina Faso, India, Kenya and Vietnam - [Read here](#)

Building Partnership for Seed System Development and Diversification - [Read here](#)

Nature+ in India: Soil Baseline in India - [Read here](#)

Mapping Above Ground Carbon Storage and Sequestration in Thoria Watershed, India: A Spatially Explicit Ecosystem Service Assessment Using InVEST Model - [Read here](#)

Delivering tree genetic resources in forest and landscape restoration. A guide to ensuring local and global impact - [Read here](#)

Diversity for Restoration (D4R) India - A digital solution to enhance resilience of trees-based restoration in Western Ghats, India - [Read here](#)

Restoring functional integrity of the global production ecosystem through biological control - [Read here](#)

Investment climate assessment for circular bioeconomy sector in India: an assessment of the institutions, policies, regulations and financial environment - [Read here](#)

Emerging circular bioeconomy business models - consumer products from agricultural waste: cases from Kenya and India - [Read here](#)

Valuing ecosystem services provided by land commons in India: Implications for research and policy - [Read here](#)

How Do Game Design, Gender, and Players' Backgrounds Affect Behavior in Framed Field Experiments? Evidence from Community Forestry in India - [Read here](#)

News and blogs

NATURE+ mobilizes new value chains for neglected crops in 5 countries - Report - [Read here](#)

Building Resilient Water Systems in Akole and Shahada, India: A Geohydrological Perspective - [Read here](#)

Scaling Circular Solutions: India's Circular Bioeconomy Innovation Hub Initiative - [Read here](#)

Telling the NATURE+ stories, hundreds of photographs at a time - [Read here](#)

NATURE+ in India fields two surveys; attends Wild Edible Plant Species Exhibition and Recipe Competition - [Read here](#)

Building Nature-Positive Seed Systems for Community Seed Banks in Kenya and India - [Read here](#)

Custodians of rare mango trees aim to increase returns for spice produced from fruit - [Read here](#)

Nature-positive farms on remote hillsides in India show the future of resilient farming - [Read here](#)

NATURE+ launches circular bioeconomy hub in India to inspire, innovate and integrate nature-positive businesses - [Read here](#)

NATURE+: Moving toward a cyan and sustainable future in India! - [Read here](#)

NATURE+ Initiative to provide policymakers with tools needed to incentivize nature-positive agriculture - [Read here](#)

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CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land, and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. www.cgiar.org

We would like to thank all funders who support this research through their contributions to the CGIAR Trust Fund: www.cgiar.org/funders.

To learn more about this Initiative, please visit [this webpage](#).

To learn more about this and other Initiatives in the CGIAR Research Portfolio, please visit www.cgiar.org/cgiar-portfolio

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