Managing India's Forests, Mitigating Climate Change.

Strengthening REDD+ in India

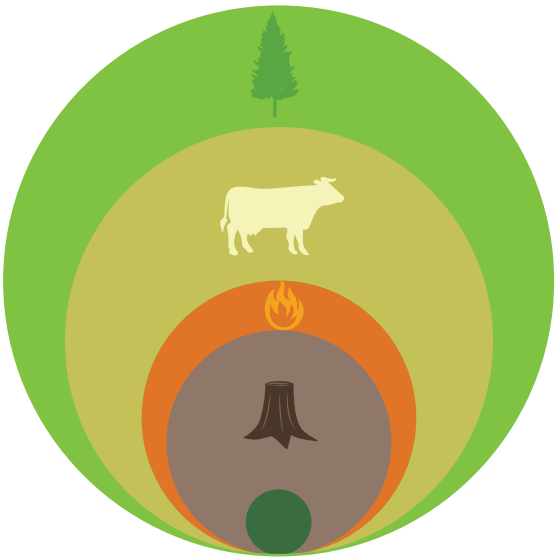
Forest-PLUS

Partnership for Land Use Science

USAID | INDIA

FROM THE AMERICAN PEOPLE

1 in 4 every people in India depend directly on forests for sustenance.



TOTAL FOREST AREA IN INDIA

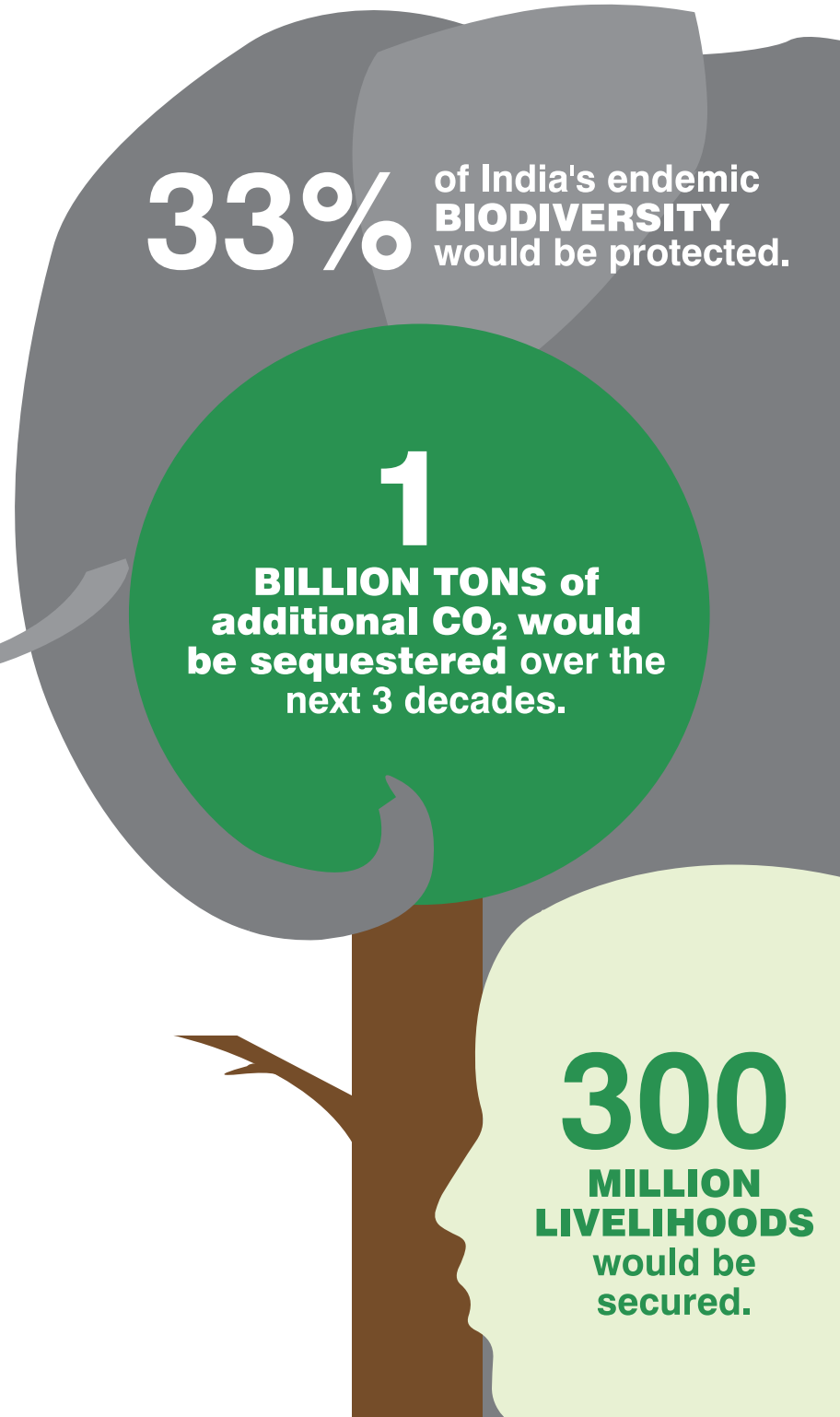
78% exposed to Heavy Grazing

50% prone to Wildfire

41% Degraded Forests

20% Dense Forests

By restoring and enhancing India's forest cover...



33% of India's endemic **BIODIVERSITY** would be protected.

1

BILLION TONS of additional CO_2 would be sequestered over the next 3 decades.

300

MILLION LIVELIHOODS would be secured.

USAID Forest-PLUS is a bilateral program between India and the U.S. to develop solutions for sustainable forest land use in India. The program, in partnership with the Ministry of Environment, Forests and Climate Change (MoEFCC), prepares India to implement successfully Reducing Emissions from Deforestation and Forest Degradation (REDD+) an international mechanism for climate change mitigation, livelihoods improvement, and biodiversity protection.

ECOSYSTEM MANAGEMENT

The Forest-PLUS ecosystem management approach proposes tools to protect, maintain, and restore healthy forest ecologies that store carbon. These include *Ecological Processes* such as forest regeneration dynamics, food webs, seed dispersal, animal migration, and biogeochemical cycling and *Ecological States* such as forest physiognomy and structure, microhabitat mosaics, species diversity and distribution,

environmental gradients, and ecotonal contacts between different habitats.

Tools, Techniques and Methods under development:

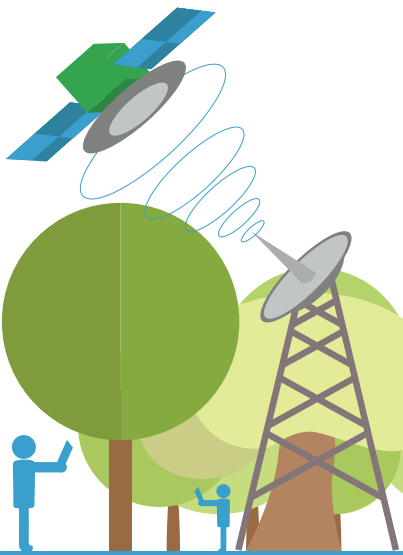
Silviculture
Forest-PLUS is identifying ecologically and socio-economically appropriate tree species and their planting techniques to restore forested landscapes. This provides local foresters and planners tools to bolster the ecological health of India's forests and the economic needs of forest dependent communities.

Forest Planning & Modeling
Forest-PLUS is developing forest planning and decision support systems. These modeling tools will allow policy makers to understand the effects of forest management choices on forest ecology and community livelihoods.

Non-Timber Forest Products (NTFPs)
Forest-PLUS is developing tools to support sustainable harvesting, propagation, community-based enterprises, and market linkages for economically important NTFPs.

Grazing Management
Forest-PLUS is developing tools to reduce grazing pressure on forests including improved animal husbandry, rotational grazing, and fodder management.

Communication Campaigns
Forest-PLUS is developing and deploying outreach tools, many using traditional street theater and art, to sensitize and train communities on forest management issues. Examples include human caused forest fires and human-wildlife conflicts.



DATA SOLUTIONS

Forest-PLUS is developing cost-effective tools to connect decentralized data generation with robust data analysis and reporting at national, state and local levels. These data solutions support transparent and improved forest management and community-based planning while laying the foundation for a community-based monitoring, reporting, and verification (MRV) of REDD+ activities.

Forest Data Management System (FDMS)

The FDMS is an enterprise solution supporting improved forest management in India. The FDMS will receive and analyse decentralised data using various tools and mobile apps being developed by Forest-PLUS. A key module of the FDMS is the Inventory Data Management System (IDMS) which measures carbon stocks and land use emission fluxes. The IDMS combines field data with the analysis of remote sensed data to report forest carbon estimates and helps India meet its REDD+ MRV requirements.

Remote Sensing Protocols

Forest-PLUS is developing advanced protocols to estimate forest carbon using ground-truthed optical and synthetic aperture radar (SAR) remote sensed data. These protocols give accurate, frequent, and higher resolution measurements of forest carbon, allowing rapid and efficient MRV of REDD+ activities.

*m*Forest App

The Forest-PLUS *m*Forest app gives forest departments and communities an efficient mobile technology-based tool for forest inventories. The app connects seamlessly with the IDMS to receive and share spatial, topographical, and ecological information.

PLAN-IT App

The Forest-PLUS PLAN-IT app gives forest dependent communities and development planners easy access to scientific and technical data and analysis to improve village-level microplanning.

Chain of Custody (COC) App for Forest Products

The COC app helps track forest products from legal origin to market. It tags the products with unique codes readable by smartphones, which then transmit the codes and spatial coordinates to regulatory authorities. This allows them to distinguish, track, and allow legal supply chains.

GOVERNANCE

Forest-PLUS is developing tools to build the capacity of MoEFCC, State Forests Departments, NGOs, forest community governance institutions and forest resource users to increase their effectiveness in forest ecosystem management including training them for REDD+ implementation.

Livelihood Benefits

Forest-PLUS is developing planning models for local communities and forest

departments to predict the socio-economic effects of different forest management decisions on community livelihoods. This encourages the participation of communities in forest management and REDD+ planning, implementation and monitoring.

Forest Policy Planning

Forest-PLUS is adapting the U.S. Forest Service developed Ecosystem Management Decision Support (EMDS) tool to help Indian policy makers optimize forest management choices based on prioritized outcome criteria.

Common Pool Resources Management

Forest-PLUS is developing an app that allows a rapid and objective assessment of the capacity of local governance institutions to manage Common Pool Resources. The spatially tagged information is mapped and added to forest management GIS and analytical models to inform planners.

Public Private Partnerships

Forest-PLUS is enabling shared responsibility for forest management in India by developing strategic alliances between public and private sector players. These PPPs address various aspects of forest conservation and management including education and training, conservation programs, technology interventions, capacity building, and improving community livelihoods.

Training & Capacity Building

Forest-PLUS is developing training programs for senior forest officials, technical and remote sensing forestry staff, frontline forest staff, and community members on various facets of forest management, monitoring and governance.

U.S.-INDIA CO-DEVELOPMENT

Forest-PLUS is leveraging the innovations, resources and expertise of India and the U.S. by bringing together government, academic and private sector players to promote sustainable forest land use and strengthen REDD+ implementation in India.

HIGHLIGHTS

Planning & Modeling

In partnership with the U.S. Forest Service, Forest-PLUS is helping adapt the Ecosystem Management Decision Support (EMDS) software to India for improved forest management decisions.

Ecosystem Management

To improve Silviculture practices in India, Forest-PLUS is partnering with ICFRE to identify ecologically and socio-economically appropriate tree species and their planting techniques.

Forest-PLUS is collaborating with IHST and the Himalayan Research Group to develop sustainable harvesting techniques for Non Timber Forest Products.

Technology Applications

In partnership with FSI, NRSC and SAC, Forest-PLUS is developing synthetic aperture radar (SAR) and optical remote sensing data analysis models, protocols, and trainings.

Public-Private Partnerships

Forest-PLUS is enabling the development of PLAN-IT, a village-level microplanning app, in partnership with 6Degrees IT and the Karnataka Forest Department.

Education & Training

Forest-PLUS is conducting U.S.-India study tours for senior Indian forest officials to enhance their knowledge and experience of REDD+. The program is also helping incorporate REDD+ training modules in the curricula of forestry institutes in India.

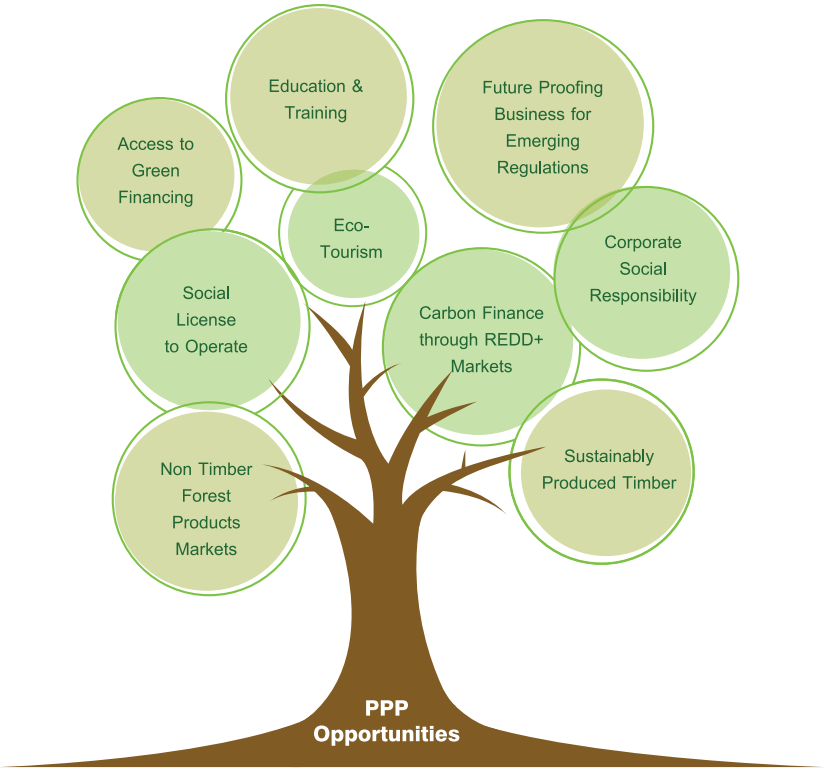
Carbon Projects

Forest-PLUS in partnership with state forest departments is developing REDD+ projects at local and jurisdictional levels and aims to link these projects with international voluntary carbon markets.

SOLVING INDIA'S REDD+ PUZZLE

REDD+ is an emerging global policy mechanism which aims to compensate developing countries for reducing forest carbon emissions and enhancing stocks, while ensuring biodiversity and community safeguards. The MoEFCC, Government of India has set up a REDD+ cell and is in the process of developing a REDD+ policy and implementation strategy.

Forest-PLUS approaches strengthen REDD+ implementation capacity in India. The Ecosystem Management and Governance approaches address the holistic REDD+ goals of biodiversity conservation and livelihood security, while enhancing forest carbon stocks. The Data Solutions ensure efficient monitoring, reporting and verification of forest information and improved socio-economic planning. The Forest-PLUS pilot project demonstrates reference emission levels/ reference levels, REDD+ accounting and benefit sharing models for Indian landscapes.



Partner with Forest-PLUS

Forest-PLUS has developed a Public Private Partnership (PPP) framework that enables stakeholders from various sectors to co-invest in improving India's forests. Forest-PLUS identifies roles for public and private sector players, creating win-win models involving communities, government agencies, NGOs and private corporations.

Forest-PLUS partners with companies whose Corporate Social Responsibility (CSR) objectives overlap with aspects of sustainable forest land use. These companies adopt Forest-PLUS' ready-to-implement tools for improved forest management. These tools help secure accountability of CSR investments in forestry.

The Forest-PLUS supported Corporate Forest Responsibility charter recognizes organizations that commit a portion of their CSR funding to support forest management.

Investing in forests provides companies direct access to forest product value chains, community relationships and access to green finance – helping secure economic, environmental and social returns.

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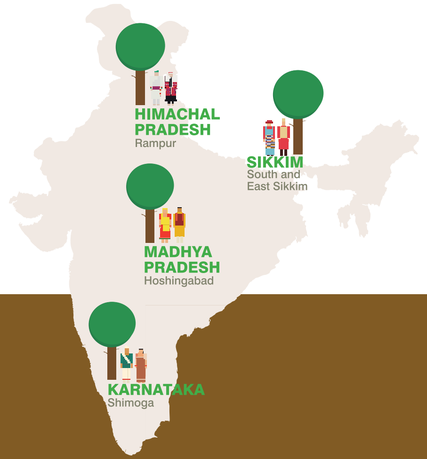
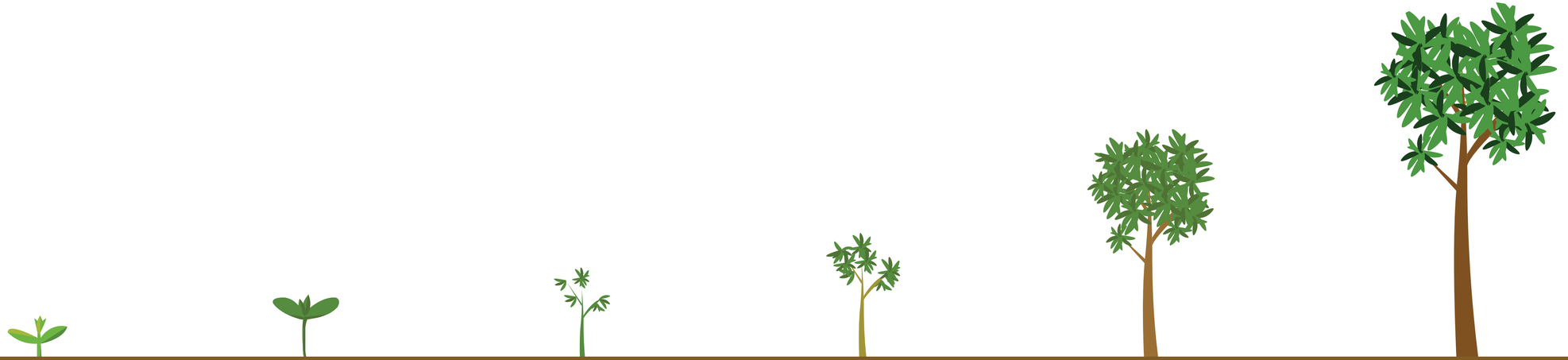
Forest-PLUS Landscapes



Forest-PLUS implementation partners:

- Tetra Tech ARD (U.S.)
- InsPIRE Network for Environment (India)
- Iora Ecological Solutions (India)
- Michigan State University (U.S.)
- Applied GeoSolutions (U.S.)
- Institute of International Education (U.S.)

Forest-PLUS Timeline



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