A Learning Management System (LMS) for India’s Forest Sector

a Forest-PLUS developed online learning platform for forestry

The LMS contains courses focused on bringing those familiar with the forest sector up to date on the latest developments and best practices. These are:

1. A course on the principles of forest carbon measurement, focused on teaching the why and how of carbon measurement and accounting, spanning the policies that undergird REDD+ to practical considerations for implementation.
2. A course on an Ecosystem Approach to Forest Management, which orients learners to forest management with the objective of a sustained yield of multiple ecosystem services.

Online learning platforms can expand the reach of instructors and allow them to focus on interaction with learners rather than content delivery; for learners, these platforms increase their ability to access and interact with the instructor. Forest-PLUS, a partnership between USAID and the Indian Ministry of Environment, Forest and Climate Change, focuses on innovations that help Indian forestry meet the challenges of the modern era.

Installation and orientation program on the Forest-PLUS learning management system and data management system at Forest Research Institute, Dehradun.

WHO CAN USE IT

The LMS is an available platform for any Indian institution involved in forest management to have and use. The software and content can be downloaded and installed on any web-enabled linux server, from which the institution can customize the platform, as well as provide access and control for use as it finds suitable.

TO GET THE LMS FOR YOUR INSTITUTION:
Write to Varghese Paul,
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FOREST DATA MANAGEMENT SYSTEM (FDMS) INNOVATION FOR FOREST MANAGEMENT IN INDIA

To integrate and manage ground-based inventory and remote sensing data, a data management system is necessary. With deployment at the Forest Survey of India, Forest Research Institute and Forests, Environment & Wildlife Management Department Sikkim, the FDMS allows for rapid planning, design, collection, analysis and reporting of forest stocks in India.

Forest Database Management System

- Facilitates REDD+ Monitoring, Reporting and Verification (MRV) and forest inventory analysis
- Ingests ground data from mobile apps and remote sensing datasets
- Stores all data in one place
- Streamlines reporting and validation
mFOREST: INNOVATION FOR FOREST MANAGEMENT IN INDIA

a new tool that enables India’s forest managers to manage forests and improve community access to resources.

Field inventory data remains an essential part of forest inventories, despite advances in remote sensing technologies. With the deployment of a mobile application built by Forest-PLUS called mForest, inventory crews and community members are able to efficiently and effectively collect inventory data and use it to calculate forest stocking and density.
The Integrated Forest Management Toolbox (IFMT) is a suite of methods and tools developed by Forest-PLUS. It will facilitate forest department officials with preparation of working plans in accordance with the National Working Plan Code, 2014 (NWPC).

Tools of IFMT:
- **Forest Resources Observatory (FRO)**
  - A tool for inventory design and analysis.
- **Forest Data Management System (FDMS)**
  - A mobile android application that provides a digital platform for collection of field data. The data can be analyzed and processed to create geo-spatial layers for visualization. (NWPC: pg.66, 27, 16, 29)
- **Forest Data Kit (FDK)**
  - Methodology for identifying areas for potential forest management activities and consultation with stakeholders (NWPC: pg.10)
- **Restoration Opportunities Assessment Methodology (ROAM)**
  - Tool for classifying areas based on water recharge potential and identify areas for forest management activities that can improve yield of water (NWPC: pg.13)
- **Composite Land Assessment and Restoration Tool (CLART)**
  - Online platform for collating and visualizing multiple geo-spatial layers

Tools of IFMT:
- **Ecosystem Services Diagnostic**
  - Mechanism for stakeholder engagement for identifying trade-offs and synergies between ecosystem services (NWPC: pg.21)

The NWPC for Indian forests calls for a landscape approach to forest management with increased focus on multiple ecosystem services and use of advanced technology and analysis.
FUELWOOD SAVING TECHNOLOGIES
appropriate technologies for improving health of people and forest

Bio-Briquettes

Bio-Briquette technology takes weeds, particularly the invasive species which are an increasing problem in India, and turns them into a combustible product using a simple process and mold that is easily manufactured in rural areas. In four days, a family can make all the briquettes needed for the month. This is a safer alternative to collecting fuelwood.

Solar water and room heater

Heating the home in the winter constitutes 60% of annual household fuelwood consumption in Himachal Pradesh. A panel of glass backed by a dark-heat absorbent material placed on a south-facing wall can raise the temperature in a cold room by 10°C. In the summer, as the sun rises in the sky, the heating effect on the vertical panel is less evident and the room does not overheat.

Low-cost solar water heaters constructed with locally available materials provide enough hot water for a household to use all day, and are easily repairable.
ACORN DIRECT SEEDING
developing low-cost techniques for reforestation of oak tree

Himalayan Oak is an important species for both rural livelihoods and for biodiversity of Western Himalayas. Its leaves are very nutritious and are therefore favored as cattle feed. The wood is valued as a durable and hot fuel. Oak is slow growing and vulnerable to biotic disturbances like forest fire and grazing. Historically a major component of the forest, due to higher population density and under-emphasis on planting oak, today the species is in short supply.

Forest-PLUS has found a way to regenerate oak through direct seeding.

The Forest Department of Himachal Pradesh has appreciated this low-cost direct seed sowing method. Additionally, involving community in this process augments their stake in the forests, thereby improving forest-people relationship for ensuring sustainable forest management.

Forest-PLUS has adapted and introduced a direct seed sowing technique for regeneration of oak

1. Collect acorns from the parent tree before they fall in the months of October and November.
2. Grade the seeds by eliminating rotten and infested acorns. Remove their cap and soak in water. Discard the floating seeds and store the remaining acorns.
3. Transport acorns in a jute bag, carrying an equal amount of soil and sand. Bury the sack in a shadowed place.
4. The seeds will germinate in three to four months’ time and will be ready for sowing.
5. Dig 3-5 inch deep pits and sow two acorns in each pit.
6. The seedling requires ample protection for regeneration and growth. Protect them from wild animals and birds.
The communication goal of the Forest-PLUS program is to create an enabling environment for REDD+ implementation in India. It does this through diversified communication platforms connecting stakeholders across various Forest-PLUS landscapes in Karnataka, Madhya Pradesh, Himachal Pradesh and Sikkim.

Forest-PLUS communication campaigns have increased public awareness on climate change, the contribution of forests in creating and mitigating greenhouse gas emissions, and how an ecosystem approach to forest management can bring environmental and livelihood benefits. Forest-PLUS has brought these messages to many audiences in India including forest-dependent communities in Forest-PLUS landscapes.
SUSTAINABLE HARVESTING TECHNIQUES FOR NON TIMBER FOREST PRODUCTS

NTFPs are an important livelihood resource in India. About 400 million people are dependent on NTFPs for their livelihoods. NTFPs contribute about 20 - 40% of the annual income of forest dwellers. The Government of India’s 12th Five Year Plan identified poor regeneration, high exploitation, and absence of sustainable harvesting methodology as major factors for reduced availability of NTFPs. Unsustainable NTFP harvesting is one of the important causes of forest degradation in the country. To counter this, Forest-PLUS has developed sustainable harvesting practices for several commercially important NTFPs like *Ailanthus*, *Garcinia*, *Madhuca*, *Buchanania* etc.

- Use net around the trees to harvest mahua flowers
- Collect mature seeds of Buchanania
- Landscape-level consultation on sustainable harvesting of NTFPs
- NTFP nursery set up at Sarahan village, Rampur, Himachal Pradesh
- Fish-bone method to sustainably harvest the Ailanthus resin
- Tools developed for sustainable harvesting of NTFPs
Forest-PLUS TRAINING PROGRAM ON REDD+

enhancing individual and institutional REDD+ capacity

Forest-PLUS has developed curricula on REDD+ and forest management. Forest-PLUS tests these curricula in training events and institutionalizes them in Indian forestry schools. Forest-PLUS organized a series of capacity building programs, including classroom training, demonstrations and hands-on training at the field level, building the capacity of forestry professionals and community members.

TRAININGS ON

• GLOBAL CLIMATE CHANGE
• FOREST INVENTORY AND CARBON MEASUREMENT
• ECOSYSTEM APPROACH TO FOREST MANAGEMENT

Curriculum and training enabled forestry professionals, frontline field staff of State Forest Departments and other stakeholders to acquire an understanding of the shift from traditional forest management to a holistic and more proactive integrated forest management on ecological principles.
Synthetic Aperture Radar (SAR) technology has the capability to penetrate through cloud cover, and operate in the day and the night. Moreover, longer SAR wavelengths are capable of penetrating the forest canopy and provide high-accuracy estimates of the aboveground woody biomass of the forests.

The protocol developed by the SAR Technical Group under the USAID Forest-PLUS program prepares well-defined techniques for forest monitoring, including mapping of forest extent and carbon stock assessment of Indian forests. It does this using open source software with a step-by-step capacity development manual to provide state forest officers the materials they would normally need to implement the protocol.

Multi Linear Regression (MLR) methodology for forest above ground biomass estimation.