

Software

TFSuite™ - The software suite "TF Suite" takes into account the inventory and management standards of Central African forests; hence it supports forest managers in their management approach. It is also based on models which, in tandem with geographic information systems, are used for designing management plans on a biological basis. Its various modules help perform the following operations: entering and streamlining inventory data, statistical processing; spatial analysis of data and assisting the division into forest management units; predicting stand evolution and the regeneration of forest resources, according to the management choices.

Foreco - A software for forest valuation and profitability calculation for natural or artificial forest stands. Based on a schedule of revenue and on past, observed and predicted expenditures, it is used for calculating the internal rate of return and updated net income, for estimating the land value and stand value at any age, using the future value method, production cost method, Vinçonneau method or combined method. French, English, Spanish and Portuguese versions available.

Stratefi - An assistance package in strategic decision making and long-term management for logging and wood processing companies in the tropics. This tool is used for simulating all the components of industrial activity, from managing the forest concession to marketing the finished product. It is custom-configured for each company using it, and can adapt to all scenarios. The simulations can be run over time-frames of more than 25 years. They are used for evaluating, comparing and testing an infinite number of different industrial strategies.

> www.cirad.fr/innovation-expertise/produits-et-services/logiciels

Sahelian ligneous species (CD-Rom)

After several editions of the practical guide "Trees, shrubs and vines in West Africa's dry zones" by Michel Arbonnier, a Cirad team has developed a software to help identify Sahelian trees: the CD-ROM "Sahelian ligneous species". This software facilitates accurate identification of the 361 species covered in this guide, which proved difficult for non-botanists, especially when the trees were not in flower. The graphic system developed is used for building up an identikit of the tree based on easily observable characteristics, even in the absence of flowers or leaves. At the end of the process, it suggests one or more species corresponding to the criteria observed. Photographs and botanical descriptions can then be used to identify the harvested plant accurately.

Training

Racin'situ - Characterising *in situ* root development of annual and perennial crops

Objectives: offer the study of various original analysis methods for root systems of annual or perennial crops, tailored to agricultural or ecophysiological research in real tropical environments. Based on specific cases, the teaching will focus on data acquisition, entry and analysis methods (customised software).

Target: Students, research engineers or technicians specialised in agriculture or ecophysiology and interested in the relationships between the soil and plant, agricultural diagnostics, water management, fertilisation, root dynamics and root turnover.

Observatories and Geographic Information Systems for Rural Planning and Environmental Management - Design, Production and Use

The training, organised in two modules, provides the methodological and operational bases for building and implementing IS and GIS.

Module 1: creating an information system and initiation in Access;

Module 2: designing and implementing a GIS, initiation in ARCVIEW.

Target: engineers, supervisors or researchers within a professional organisation, a territorial community, State administrations, a development project or a research institute, entrusted with designing an information system, monitoring and implementing it, and interpreting the results.

Next session in October 2011

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VIP

VALORISATION ET INNOVATION
EN PARTENARIAT

Warm-region forests

Forest exploitation or conservation poses a number of problems. Whether they involve climate change, the needs of local populations or those of industry, these problems are very often associated with excessively short-term management. Not taking into account stock renewal beyond maximised profitability, not accepting the importance of biodiversity in spite of its maintenance costs or, more generally, not taking into account preservation of the environment, and opting for instant profits; all this can lead to situations of devastated and polluted zones, their resources plundered, lands rendered unfit for cultivation... We cannot therefore neglect the direct impact of the plethora of human activities and bad practices, sometimes dating back many years, which can lead to accelerated deterioration of forest ecosystems.

By virtue of its experience and expertise in tropical forests (knowledge of environments, management methods, etc.), Cirad lends its support to decision makers, to rural communities and to all players (economic, civil society, etc.) involved in environmental management, in order to improve the integration of human activities therein.

FOCUS

80% of deforestation of the forests of Central Africa is due to slash-and-burn farming and to the use of fuelwood for domestic energy.



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LA RECHERCHE AGRONOMIQUE
POUR LE DEVELOPPEMENT

Expertise, projects and partnership

Makala project (2009–2013)

Its objective: to enable a sustainable supply of domestic energy, and make the transition to sustainable management of wood resources. The project activities operate in the Democratic Republic of Congo, around Kinshasa and Kisangani, and in the Republic of the Congo, around Brazzaville.

"In zones where the Makala project is operating, the progressive disappearance of the wood resources is mainly due to supplying the towns and cities with fuelwood for energy. The definition of a project with regional scope, mobilising around ten different partners, demands a pre-requisite capacity for appraisal and extensive knowledge of the regions under investigation. The project is aimed at local impacts relating to knowledge of the socio-ecosystems, definition of good practices and the design of sustainable management plans for damaged ecosystems. In the long term, it will lead to recommendations in terms of public policies."

Jean-Noël Marien, Cirad

Some of the pre-requisite skills deployed by Cirad for definition of the project

- Knowledge of the forest plantations was developed by the CRDPI in Congo-Brazzaville
- Cartographic analyses of the evolution of forest stands were implemented on the pioneering fronts in Brazil
- The carbonisation and biomass-energy aspects are harnessing previous and current works, on Madagascar and in the African dry zone
- Socio-economic analyses and the participatory approach were derived from previous works, particularly in Cameroon
- Works on the impacts of climate changes and the MDP & REDD processes are capitalising on the results of works conducted in the sub-region, but also throughout the international negotiations on the subject.

> <http://makala.cirad.fr/>



RESEARCH issues

For Alain Karsenty, a Cirad researcher, *"A fundamental issue must not be forgotten, the issue of land rights, since the rehabilitation of forest zones works over time-scales ranging from ten to fifty years. Millions of people live on them and use their products, but have no legal rights to the plots that they are farming. Communities made responsible for their lands by the assurance that they will have the tenure for a certain period of time take more interest in training in ad-hoc farming techniques, sustainable cultivation and improving soil fertility. This question of land security is also central to the issue of Payments for Environmental Services (PES), which are generating a great deal of hope for the conservation of ecosystems in Southern countries."*

Further reading can be found in *"Perspectives"* on www.cirad.fr: "Deforestation and climate change: acting on the causes. What the [carbon] market cannot do..."

Support and advice on public policies

For the past decade, development models have been transformed by new discussions promoting multi-functionality in agriculture, the role of family-based agriculture and the importance of rational exploitation of the environment, in order to reconcile production and conservation. Public policies and their impact on jobs and revenue, on living conditions, diet and health conditions, and on migratory processes have therefore become research subjects enabling us to understand the resistance to change and the levers for development.

Cirad lends its expertise to help analyse and support the development of public policies in the agricultural sector, the food industry, land-use planning and management of environments and resources. Hence it is a major partner in developing and designing new regulatory frameworks.

- > Research unit: Tropical Forest Goods and Ecosystem Services
- > VIP contact: christine.durand@cirad.fr

Cirad and IRD, partners in the interactive forest Atlas

This tool, aimed at managers and decision makers, represents free access to knowledge – hitherto heterogeneous and dispersed – about vegetation surveys, forest inventories at different periods, herbaria, etc. This information has been collected by botanists, ecologists and foresters over several years' exploitation of the trees for their wood. <http://phyto-afri.ird.fr>

Sustainable management of forest plantations

To meet the growing market needs, planted tropical ecosystems must increase their long-term productivity without damaging the environment. The environmental and climate conditions, previous cropping and practices may have a long-lasting impact on the evolution of these ecosystems. To ensure optimal management of tropical forest plantations, Cirad supports the players in the design of suitable management methods. It provides original know-how drawn from its historic experience, and uses an unequalled collection of forest data, thereby harnessing its fine knowledge of the principles, criteria, indicators and checks of sustainable management which are now applied to natural forests.

This appraisal capacity has been deployed with private companies for sustainable management of forest plantations on peat in Indonesia, and for pine plantation inventories in Tango (northern province of New Caledonia).

- > Mixed research unit: Functional Ecology and Biogeochemistry of Soils and Agro-Systems (ECO&SOL)

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Measuring the impact of human activities on tropical forests

Rebuilding the dynamic of agricultural landscapes, monitoring forest practices and tracking mining activities, etc. In Brazil, Guyana (with INRA and other partners) and in all warm-region forest zones, Cirad is a partner that harnesses its scientific experience in remote sensing.

- > Research unit: Tropical Forest Goods and Ecosystem Services
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Other areas of expertise...

- Analysis and comprehension of heterogeneity of forest canopies at various time and space scales, to explain their variability
Vegetation inventory protocol; planning and management: productive tropical forests, community forests, protected areas
> VIP contact: christine.durand@cirad.fr
- Methodology of genetic improvement of forest species;
Improving selection methods
> VIP contact: anne-marie.schelstraete@cirad.fr
- Forest exploitation system diagnostics
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www.cirad.fr/nos-recherches/productions-tropicales/essences-forestieres/