

REDD Research and Development Center - FFPRI



**Forestry and Forest Products Research Institute
Japan**

What is REDD-plus?

It is required to reduce emissions of greenhouse gases from deforestation and forest degradation in developing countries, which account for nearly 20% of greenhouse gases from anthropogenic sources. Reducing Emissions from Deforestation and Forest Degradation is referred to as REDD. ‘REDD-plus’ goes even further. Following the Copenhagen Agenda, COP15, the REDD-plus framework includes additional roles of conservation, sustainable management of forests, and enhancement of forest carbon stocks.



The Role of the Forestry & Forest Products Research Institute (FFPRI) to Address Global Warming

Japan has a particular responsibility to reduce emissions of greenhouse gases because it is a major consumer and importer of tropical timbers from developing countries. The Clean Development Mechanism (CDM) framework aims to reduce emissions through a variety of activities by implementing an emission-reduction project in developing countries. Afforestation and reforestation project activities under the CDM aim to remove CO₂ from the atmosphere. In addition to these activities, REDD-plus will play a key role in reducing emissions and enhancing forest carbon stocks. REDD-plus also has the potential to promote co-benefits including alleviating poverty, improving governance, and conserving biodiversity and securing forest ecosystem services. Japan expects that REDD-plus will contribute to regional economical development in developing countries as part of an overall strategy to address global warming.

The REDD Research and Development Center (REDD R & D Center) was founded within the Forestry and Forest Products Research Institute (FFPRI) in July 2010. Through international and domestic cooperation it will provide a technical hub for REDD-plus activities in Japan, including technical development and giving support to private sector activities within the REDD-plus framework.

Immediate challenges

Some technical and political issues require solutions before REDD-plus activities can be fully implemented. First, a monitoring system is required that meets the guidance on Measurement, Reporting and Verification (MRV). This in turn urgently requires scientific methodologies for evaluating greenhouse gas emissions and carbon sequestration to be put in place. Although the United Nations Framework Convention on Climate Change (UNFCCC) encourages developed countries to build the necessary capacity to promote REDD-plus activities in developing countries, the former are still provided with insufficient specialists and infrastructure.

To solve these technical, political, and social challenges, we at the REDD R & D Center, actively carry out research and development in cross-cutting issues relevant to REDD-plus. We train specialists, and we support relevant projects in the private sector by fostering cooperation between industry, educational institutions and the governmental administration.



Projects in REDD Research and Development Center

For the REDD-plus framework to be effective, we undertake the following roles in the FFPRI-REDD Program in the REDD R & D Center:

- (1) to review issues identified as internationally important and discussed at international conferences, and issues relevant to REDD-plus activities in developing countries, in order to clarify which future tasks need to be implemented by Japan through REDD-plus mechanisms or their equivalents in other countries.
- (2) to develop remote sensing methodologies and analytical techniques in order to monitor deforestation and forest degradation in developing countries.
- (3) to develop monitoring systems and to propose guidelines for the implementation of REDD-plus framework activities in developing countries in cooperation with the private sector.
- (4) to provide a REDD-plus activities Open Forum for active and interested parties to exchange information, and to increase its capacity by reinforcing collaboration between government, industry and academia.
- (5) to train specialists with the necessary experience and expertise to carry out REDD-plus activities.



The FFPRI-REDD Program will work together with international institutions, academia, government, research institutions, private companies, NGOs and potential REDD investors, to maximize efficiency and the effectiveness of the organizations' collective input.

We aim to build confidence in REDD-plus and to raise awareness about REDD-plus mechanisms among the private sector, decision makers, and NGOs in Japan and other countries, by providing information about our activities and achievements through international conferences, the internet, scientific publications and other promotional literature.



To ensure the overall success of the Program, an Advisory Committee led by Professor Masahiro Amano has been set up to discuss practical issues, and provide overall and strategic direction.

Current Members of the Advisory Committee

Masahiro Amano, Waseda University
Makoto Inoue, The University of Tokyo
Toshinori Okuda, Hiroshima University
Nopea Sasaki, Hyogo Prefectural University
Takeshi Tange, The University of Tokyo
Satoshi Tsuyuki, The University of Tokyo
Tohru Nakashizuka, Tohoku University
Hiroto Mitsugi, Japan International Corporation Agency
Kana Yamashita, Conservation International Japan
Mari Yoshitaka, Mitsubishi UFJ Morgan-Stanley Securities Co., Ltd.

Global Activities of FFPRI

The FFPRI brings together technical teams from around the world, including specialists in such areas as carbon sequestration and forest inventory monitoring, to attend international conferences such as the IPCC, the SBSTA, and the GOFC-GOLD. This helps the development of analytical procedures and guidelines on issues such as the measurement, reporting and verification (MRV) of carbon emissions and flows. The FFPRI-REDD Program also seeks to build consensus and knowledge about the REDD-plus framework, in order to ensure the inclusion of a REDD-plus mechanism in any post-2012 climate change agreement.

Research activities on REDD-plus in FFPRI

Monitoring deforestation and degradation of tropical forests by satellite imagery

CO₂ emissions from deforestation and forest degradation in developing countries account for 20% of greenhouse gases generated by anthropogenic activities. Reducing or eliminating such practices will inevitably cause a consequent reduction of greenhouse gases in the atmosphere. The REDD framework is now being developed as an international mechanism to achieve this goal.

The FFPRI develops methods to integrate remote sensing techniques with ground measurements for forest monitoring. Remote sensing by satellite is a particularly useful technique for monitoring forests over large areas. It is especially effective when monitoring deforestation and forest degradation in developing countries.

Identifying processes of deforestation is relatively easy with satellite data because of gross changes in types of land-cover. However, forest degradation by illegal logging and changing patterns of cultivation is much more difficult to observe. Advanced techniques are therefore required to identify forest degradation caused by specific activities.



Monitoring deforestation by Landsat satellite. Left, 1989; Right, 2001. Landsat data were provided by GLCF, Maryland University, and were distributed by MAFFIN-LGLC.



The FFPRI is currently developing methods to estimate changes in carbon stock levels and to identify the various causes of forest degradation by using multi-temporal or high-resolution satellite data in combination with ground measurements.

The FFPRI is also researching ways of using the Synthetic Aperture Radar (SAR) carried on the Japanese ALOS satellite, and exploiting its ability to penetrate cloud cover in order to identify deforestation and forest degradation in cloud-covered tropical rain forests.

Collecting data through ground-based measurement

Among the important greenhouse gases generated by forestry, CO₂ from biomass and soil organic matter is the most important source due to its potential to be emitted in large volumes from deforestation and forest degradation processes. The REDD R & D Center will collect data of forest biomass. Since few roads exist in tropical forests from which ground-based measurement can be made, remote sensing techniques will be used to collect data when devising appropriate reference scenarios and monitoring methodologies.

Important subcategories of greenhouse gases are emitted by different types of biome and from different causes of deforestation and forest degradation.



Methodologies therefore need to be developed which take into account different human activities affecting present land use, such as the conversion of forest to agricultural land, and logging.

For example, previous studies have developed a simplified method for estimating CO₂ emissions from the deforestation and degradation of important forest types, by monitoring and periodically summing the areas under different land-use. Changes in carbon stock are then calculated from these areas and their corresponding average carbon stock values.

The most practical method of data collection should be chosen from the range of options while taking into consideration the data available in, and resources of, a target region. We therefore intend to identify the most practical methods while collecting field data, and to use our experience to draw up instruction manuals that will ensure efficiency and consistency during further data collection by others.



Socio-economic analysis of deforestation and degradation of tropical forests

The objectives of this study are to clarify the major causes and processes of deforestation. This will highlight how best to reduce deforestation and forest degradation, and provide the necessary information to establish an effective and acceptable REDD system.

Various factors such as economic, demographic, political and institutional factors drive deforestation. However, the driver is usually a combination of proximate causes and underlying causes, which vary from region to region.

It is therefore necessary that we understand these different causes of deforestation in order to establish an effective REDD system. We will therefore use qualitative and quantitative methods with socio-economic data and deforestation rates to identify and analyze those proximate and underlying causes that drive the processes of deforestation.

In addition to analyzing causes of deforestation, we will investigate the effects of forestry policy and other related policies on forest conservation in order to identify those factors that are most likely to reduce deforestation and forest degradation. The results of these analyses, together with a review of recent discussions regarding what form any REDD scheme should take, will provide the necessary information to make an REDD system effective in reducing deforestation and forest degradation, and to make it acceptable both to international and local communities.



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