



FACTSHEET

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# Developing the tools to make REDD+ work

Forest & Climate Initiative

## ENSURING REAL PROGRESS IS MADE IN EFFORTS TO REDUCE EMISSIONS FROM FOREST LOSS

Forests are often referred to as 'carbon sinks' because they suck up carbon dioxide, one of the polluting greenhouse gases that cause climate change, and store it as carbon. Forests are among the largest storehouses of carbon on the planet, after oceans. But when forests are destroyed, they release this carbon back into the atmosphere. Today, deforestation and forest degradation accounts for up to 20% of global carbon emissions. Because of this, finding a way to halt forest loss and degradation is a fundamental part of fighting climate change.

Reducing deforestation and forest degradation in developing countries and the conservation, sustainable management and enhancement of forest carbon stocks (collectively referred to as REDD+) is an effort to make forests worth more standing than cut down. By putting a value on the carbon stored in tropical forests, countries can be provided with economic incentives to maintain them. But, for REDD+ to succeed, the global community needs to demonstrate that the carbon held in forests can be efficiently and accurately monitored and reported across large forest areas.

This will ensure that it's possible to verify whether real progress is being made in preventing emissions from forest loss.

Doing all of this is a big job requiring an adequate system but with the proper toolkit, filled with the right tools, it can be done. WWF is supporting forest countries' efforts to develop that toolkit by developing systems to measure, monitor, report on and verify the amount of carbon held in forests (collectively referred to as MRV systems).

For REDD+ to work, both comprehensive MRV systems and the tools to carry MRV out are needed to accurately measure the amount of carbon in forests, and monitor and report human induced or naturally occurring changes over time. Forest countries need financial, technological and capacity-building support to develop these robust MRV systems.

WWF is working with local communities and regional and national governments to support efforts to get ready for REDD+.

### WHAT IS MRV?

M = Monitoring & measuring the carbon stored in forests

R = Reporting the amount of carbon and changes over time

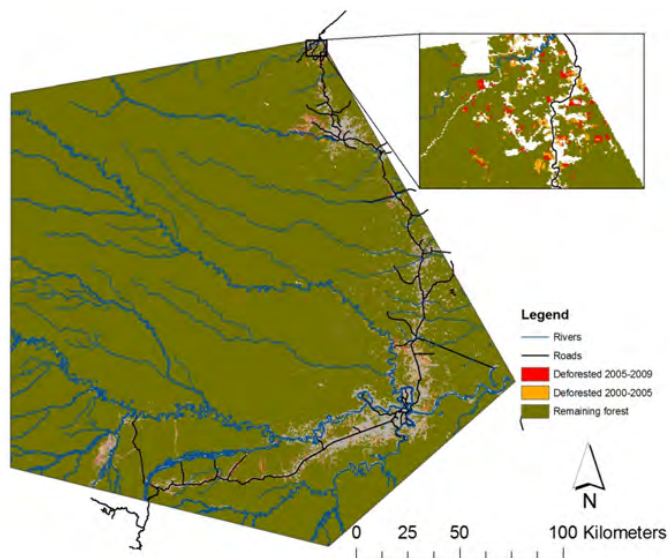
V = Verifying whether the reported measurements are accurate

## WWF'S APPROACH

WWF's local to global reach allows us to act across all levels - from a boots on the ground approach to measure carbon in forests to supporting countries to develop national MRV systems to supporting the establishment of strong standards for an international MRV framework.

Our work includes:

- Building a network of partners for **measuring** and **monitoring** forest carbon on the ground in forest countries
- Supporting countries' efforts to establish systems for **monitoring, measuring, reporting** and **verifying** forest carbon and making this information available to the public
- Participating in the development of tools and approaches to support **monitoring** and **reporting** on the carbon in forests and to help decision makers visualize the impacts of future land use decisions on forest carbon and forest biodiversity
- Collaborating with communities, local governments and institutions to build civil society participation in establishing deforestation reference levels at both a national and sub-national scales by **reporting** and **verifying** current and future drivers of deforestation



Deforestation data generated using a combination of automatized classification tools, expert analysis and field validation for a study area in Madre de Dios, Peru.

Source: N. Aguilar-Amuchastegui and J.C. Riveros. 2011. *Lessons for MRV from the Guyana-Norway MOU: Relating historical deforestation rates, reference levels, BAU modeling and a carbon map for emissions reductions estimates for REDD+. WWF.*

## A FOUR STEP PROCESS TO MRV

Monitoring, measuring, reporting and verifying forest carbon (MRV) is a four step process:

1. **Monitoring** refers to detecting deforestation and forest degradation. Monitoring helps countries identify what's driving forest loss and direct efforts to slow or halt forest loss the areas under greatest threat. It also allows countries to develop reference levels for changes in forest cover based on historical rates of deforestation. These reference levels can be compared with rates of deforestation observed once mitigation actions have been implemented.
2. **Measuring** allows countries to link the changes observed in forest cover during the monitoring process with estimates of the amount of carbon stored in forests. This enables countries to determine how much the carbon in their forests is worth under a financial agreement that compensates countries for keeping forests standing.
3. **Reporting** the amount of carbon in forests and changes over time defines both how the information generated in the measuring and monitoring process is used as well as the standards to follow during the process. Though the technology and science of measuring and monitoring may change, a common set of standards used in the reporting process ensures that the information gathered in the measuring and monitoring process can be compared.
4. **Verifying** whether reported measurements of forest carbon are accurate should ideally be done in a transparent and participatory manner. Verification could include a third party intermediary and social networks, including community participation.



## PROTECTING BIODIVERSITY AND HALTING FOREST LOSS IN INDONESIA

Tropical forests contain the greatest diversity of life of Earth and are home to up to 50% of the world's known species. Over 1 billion people rely on forests for their livelihoods. The precious resources and essential benefits that forests provide to people and the planet are referred to as their 'natural capital'.

WWF is working with a ground-breaking mapping and modeling tool, called InVEST, which enables users to visualize the impacts of land use decisions on this natural capital. This, in turn, allows decision-makers to identify ways to enhance both the development and conservation of ecosystems.

InVEST is a tool being developed as part of the Natural Capital Project that models and maps the delivery, distribution and economic value of ecosystem services and biodiversity. This innovative software is being used to integrate ecosystem services into decision-making in a variety of places around the world through the WWF network and partners.

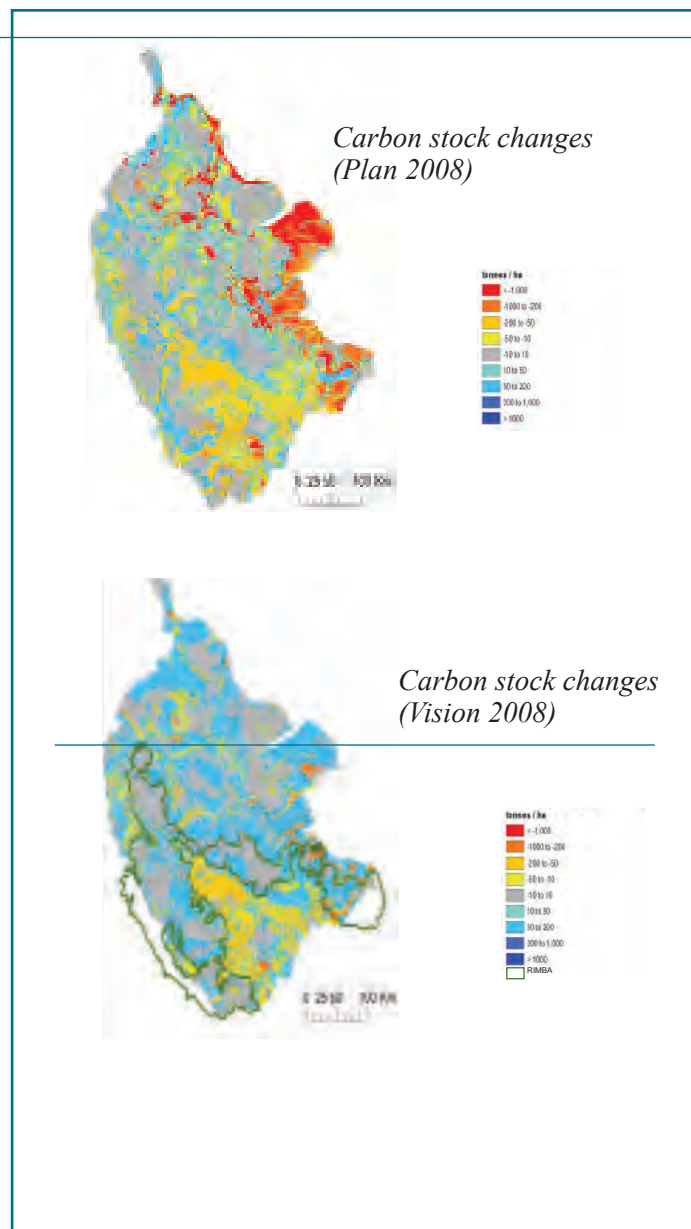
District and provincial government policy makers in Sumatra, Indonesia are using InVEST to explore ways to develop a land use plan that integrates ecosystem services and biodiversity conservation. This so-called 'ecosystem-based spatial plan' guides local government planners in decisions on whether, and where, to award concessions for economic activities, such as oil palm and pulp and paper plantations.

InVEST was used to assess the quantity and location of high quality habitat, carbon storage and sequestration, annual water yield, erosion control, and water purification under two scenarios:

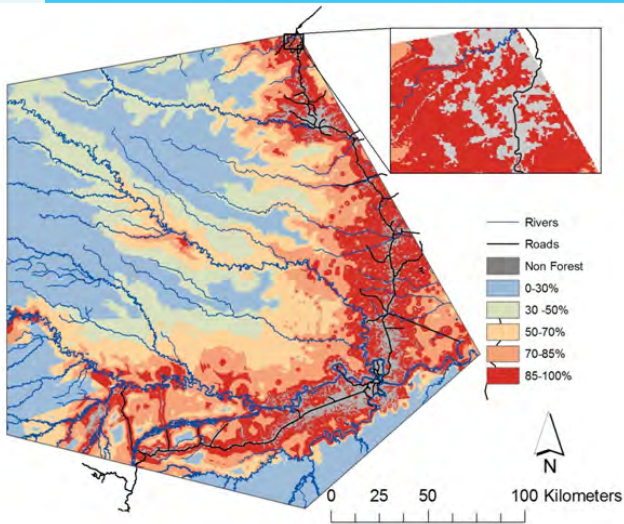
1. Implementation of the current government spatial plan  
(map: *Plan 2008*)
2. An 'Ecosystem Vision' of sustainable land use that better balances environmental, social and economic considerations  
(map: *Vision 2008*)

This information is crucial for REDD+ as it helps identify the best areas for forest restoration, payments for carbon sequestration under a REDD+ scheme, and best management practices for forestry and plantations.

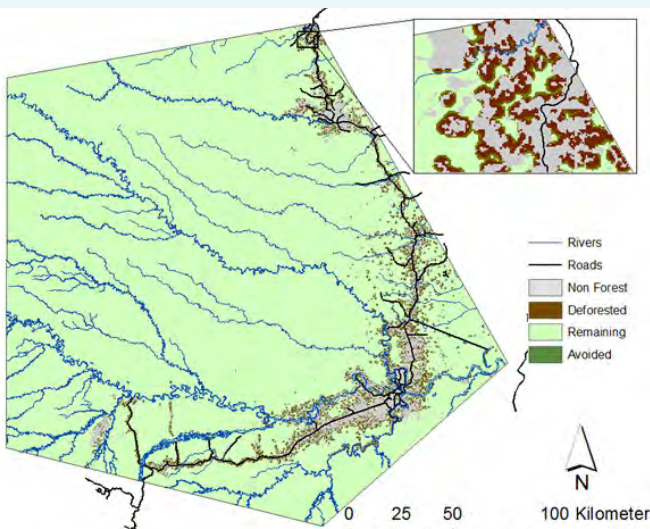
Helping decision-makers visualize the impacts of land use decisions on not only the carbon stored in forests, but also on biodiversity, is crucial to ensuring that efforts to halt forest loss also safeguard forest species.



InVEST enables users to visualize the impacts of land use decisions. These maps depict carbon stock changes under the Sumatra vision (top map) and the government plan over 50 years (bottom map), relative to 2008. The vision would result in carbon sequestration whereas the plan would result in net emissions.



Using historical deforestation rates and data on drivers of deforestation, WWF is mapping forest areas at highest risk of deforestation. These results are used to identify areas where REDD+ could be part of efforts to halt forest loss and curb associated emissions.



Using maps of forest areas at highest risk of deforestation and linking these with reference and historical rates of deforestation, the areas that would be lost under a given deforestation rate can be identified. By using carbon estimates specific to those areas, the amount of potential emissions under different scenarios can then be estimated.

Source: N. Aguilar-Amuchastegui and J.C. Riveros. 2011. Lessons for MRV from the Guyana-Norway MOU: Relating historical deforestation rates, reference levels, BAU modeling and a carbon map for emissions reductions estimates for REDD+. WWF.

## MAPPING THE RISK OF DEFORESTATION IN THE AMAZON USING INNOVATIVE METHODS

WWF is developing a novel approach to identify the areas most likely to be deforested in the forests of Peru's south-western Amazon. This work builds on carbon mapping previously undertaken in coordination with the Peruvian Ministry of the Environment (MINAM) and the Carnegie Institute using LIDAR technology, which creates high-resolution maps of the carbon stored in the forests. This new method is able to identify, with over 90 per cent accuracy, the areas most likely to be deforested while also identifying what's driving forest loss and therefore, where efforts to stop forest loss should be directed.

WWF is working with MINAM and other partners to develop a historical baseline of deforestation in the Madre de Dios region of Peru. By linking deforestation modeling results with historical deforestation data and established reference levels, we are able to generate estimate of the carbon emissions that could be recognized under agreements to reduce emissions from deforestation and forest degradation.

## CURBING FOREST-BASED EMISSIONS

WWF will continue to innovate and collaborate on leading technologies that enable REDD+ programmes to accurately measure, monitor and report on the carbon stored in forests to ensure real emissions reductions. At the same time, we're working to ensure that international frameworks for REDD+ conserve biodiversity and protect the rights and livelihoods of forest dwelling communities. We are also supporting forest countries as they develop national and sub-national approaches to halt forest loss and curb forest-based emissions. Making REDD+ work is vital to ensuring the world's forests are maintained for the benefit of people and the planet.

To find out more, visit [panda.org/forestclimate](http://panda.org/forestclimate)

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#### Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

[www.panda.org/forestclimate](http://www.panda.org/forestclimate)