

Informing Land-Use Plans in Central Sumatra

Balancing development and conservation goals

The Natural Capital Project (NatCap) is working with WWF and other partners to integrate natural capital valuation into spatial plans guiding development and conservation on the island of Sumatra in Indonesia. Some planning options devised with the input of InVEST models result in higher carbon stocks, reduced sedimentation, cleaner water, and greatly enhanced habitat quality, while also providing land for forestry and oil palm production. As a result of this work, the Millennium Challenge Corporation is promoting comprehensive ecosystem service assessments, such as those conducted with InVEST, as a way to direct millions of dollars in forest investments to reduce greenhouse gas emissions.

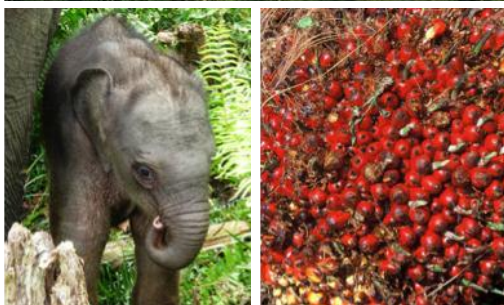
Building a sustainable land-use plan for Sumatra

Working with Indonesian government agencies and local NGOs, NatCap supported WWF-Indonesia in helping district and provincial governments of central Sumatra consider ecosystem services in their land-use plans. Rapid proliferation of palm oil plantations and commercial forestry requires government officials in Sumatra to balance tradeoffs in revenues and livelihoods from these industries with their impact on nature's other benefits to human well-being. Sumatra's forests and peatlands store

huge amounts of carbon, produce essential foods and medicines, purify water supplies, and provide habitats that maintain biodiversity among species of global consequence. By analyzing the impact of development activities on resources of interest, government agencies in Indonesia can generate long-term plans to maintain these critical ecosystem services.

A Green Vision for Sumatra

In February 2012, NatCap and WWF published a new report, the first of its kind, which uses ecosystem services information from InVEST to recommend strategies for sustainable land use planning and resource management in Sumatra. *A Green Vision for Sumatra* demonstrates how spatial and economic analyses of ecosystem services and wildlife habitat can support development planning in Indonesia at multiple scales. Through consistent accounting of the services nature provides Sumatran people, the report captures the full costs and benefits of alternative development trajectories. Its results draw from a comparison of Sumatra's landscape in 2008 with a possible 'business as usual' future and a proposed "Ecosystem Vision for Sumatra." The report includes strategies for interpreting spatial data from InVEST and applying it to management decisions. It also provides policy recommendations for the Indonesian government and leading foreign aid agencies, such as the Millennium Challenge Corporation.



Results

■ Informing Land-Use Plans

InVEST maps and associated analyses have informed spatial planning decisions in several provinces in Sumatra, such as Jambi, and a Strategic Environmental Assessment for Jambi Province.

■ Safeguarding Natural Capital

Our analysis in Sumatra offers practical options to safeguard natural capital. InVEST can provide local planners with information they need to target districts for conservation and development activities.

■ Providing Clear, Consistent Metrics of Ecosystem Benefits

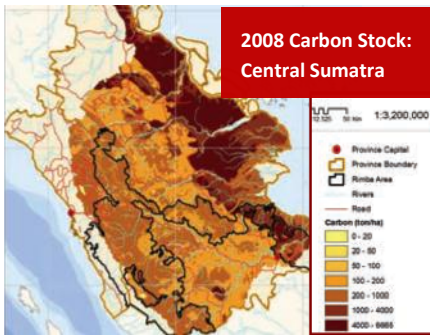
Our modeling outputs suggest that implementing the Sumatra Vision can result in higher carbon stocks, reduced sedimentation, cleaner water, and greatly enhanced habitat quality.

■ Directing Investment Decisions

The Millennium Challenge Corporation has signed a Compact Agreement with the Indonesian government to fund \$600 million for projects for sustainable development and offsetting carbon emissions. In their call for proposals, they recommend that ecosystem service assessments, such as the one conducted with InVEST, be used to guide priorities for investments.

■ Support from Government Agencies

The Sumatra Ecosystem vision has been endorsed by the Indonesian Ministry of the Environment, Ministry of Public Works, Ministry of Forestry, and Ministry of Home Affairs.



Ecosystem Services

Carbon Storage & Sequestration

Forest carbon projects in Central Sumatra's peat swamps and upland forests offer global climate benefits, and support Indonesia's goal to reduce carbon emissions by 26% from 2005 -2020. Over 50 years, the Sumatra Vision will replenish 350 million tons of carbon stock, while the current government plan would result in net carbon loss.

Biodiversity

Sumatra's tropical rainforests are home to many endangered species of animals including Sumatran tigers, elephants, orangutans and rhinoceroses. They also harbor over 15,000 known species of plants.

Hydropower

Hydropower is an important source of electricity in the region. Healthy forests upstream can reduce sedimentation in the rivers and limit the amount of dredging required at the hydropower facility.

Water Quality & Quantity

InVEST models can map and value the water supply to a region, which is critically important to human health as well as to agricultural production in Sumatra.

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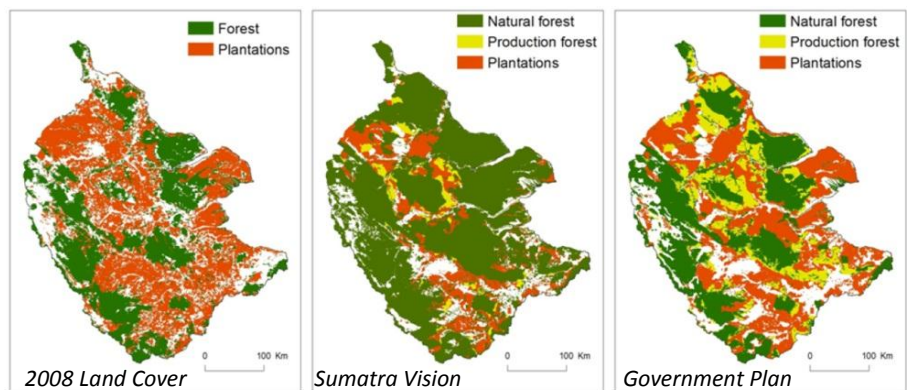
A Historic Commitment to Conservation

In Indonesia, district and provincial spatial plans specify where timber harvest, plantation expansion, infrastructure development, and conservation will take place. In 2010 the 10 governors of Sumatra made an island-wide commitment to conduct ecosystem-based spatial planning, which supports sustainable development and conservation. The plan addresses environmental, climate, and livelihood concerns and also identifies critical areas for biodiversity and peatland conservation. Six national government agencies and a forum of NGOs developed an ecosystem vision for Sumatra as an alternative to the existing government spatial plans.



Comparing Development Scenarios with InVEST

To develop land-use plans for Central Sumatra that balanced development and conservation goals, WWF worked with stakeholders to develop scenarios of different possible futures - one reflecting 'business as usual', and the other balancing conservation and development objectives. The InVEST software suite was used to value and visualize how ecosystem services (such as carbon storage and sequestration, water quality and quantity, and habitat quality for biodiversity conservation) would respond to alternative land uses. InVEST quantified and produced maps of ecosystem services, illuminating tradeoffs and synergies among multiple services and economic activities. Combining this information with stakeholders' input, a comprehensive plan was identified to increase carbon stocks, reduce sedimentation, more efficiently clean water, and enhance habitat quality for critical species.



Above, both development scenarios show significantly more forest cover than in 2008. Production forests - where logging and conversion can take place - drive the increase under the Government Plan, while the Sumatra Vision results in a greater proportionate increase in natural forest cover.

Informing Land-Use Planning in Sumatra

As a result of the continued in-country analysis of WWF-Indonesia, ecosystem service information has been incorporated into a Strategic Environmental Assessment for Jambi Province. Jambi and multiple district governments are now using this information to develop official land-use plans that guide permitting and development decisions for the region.