



## Forest valuation stimulates green development policies in the Province of Aceh, Indonesia

**Compiled by:** Johannes Förster and Augustin Berghöfer (UFZ)  
mainly based on van Beukering et al. 2003

**Short title:** Forest valuation stimulates green development policies in the Province of Aceh, Indonesia

**Key Message:** It has been demonstrated through ecosystem services valuation that sustainable management and conservation of tropical forests in Aceh, Indonesia, has greater benefits than deforestation. Motivated by the growing potential for markets in ecosystem services (e.g. water, carbon storage), the new government of Aceh has launched a green development strategy and declared a moratorium on logging.

**Suggested citation:** TEEBcase Forest valuation stimulates green development policies in the Province of Aceh, Indonesia based on van Beukering et al. (2003 and 2008), compiled by Förster J. and Berghöfer, A. (2010) available at: [TEEBweb.org](http://TEEBweb.org).

**Reviewer:** Jane Dunlop, Pieter van Beukering, Godfrey Yeung

### What was the problem?

The Leuser ecosystem in Aceh (a province in northern Sumatra, Indonesia), comprises one of the largest remaining continuous forest ecosystems in Southeast Asia, covering over 25,000 sq kms. This ecosystem has an outstanding richness of biodiversity which is partly protected by the Gunung Leuser National Park (ca. 8000 sq kms) and buffer zones. Due to years of conflict and political instability, not all logging concessions were logged and deforestation was slow compared to other regions. In more recent years, however, an end to conflict and a need for timber for reconstruction after the tsunami of 2004 has put pressure on the forests in the form of both legal and illegal logging.

The forests, wetlands and coastal ecosystems provide important ecosystem services that sustain the livelihood of the rural and urban population in Aceh. In areas where forests are logged, both urban and rural populations are exposed to a greater risk of floods and erosion as well as the loss of sustaining forest services (water purification, bush meat, wild plant materials, medicines and food). Furthermore, the revenue from precious hardwood timber is in large part captured by non-local companies.

Several attempts and strategies by local and international NGOs and donors to protect the forest in and around the Leuser National Park have had either little success or have failed for more than a decade. This is mainly due to lack of interest by policy makers, powerful elites and companies in sustainable forest management and conservation.

### Which ecosystem services were examined? And how?

The management of the Leuser National Park recognized that presenting the facts about the declining numbers in the orang-utan population were not influencing the decisions of local

policy makers. The loss of forest continued. Therefore, the managers of the park commissioned a study to determine the economic value of the Leuser ecosystem's services. This study compared the impact of different forest use scenarios on the province's potential for economic development (until 2030).

The benefits from 11 different ecosystem services over a period of 30 years were estimated by van Beukering et al. (2003) in the study which covered over 25,000 sq kms of the Leuser National Park. These services included timber, food and fibre, water provision, flood prevention, carbon storage, tourism and hydro power. Three scenarios were compared: "Deforestation" (a continuation of the current trend), "Selective Use" (a substantial reduction in primary forest logging and compulsory reforestation) and "Conservation" (logging prohibited).

The forecasted impacts of each scenario were determined for five groups: local communities, local governments, national governments, industries and the international community. Values for services were calculated using mostly market prices and production costs. Some values were identified locally and others were selected from other regions and adapted to local context (benefit transfer).

Conservation and selective use scenarios were found to provide the highest benefits for the region (US\$ 9.1-9.5 billion in 30 years, using a 4% discount rate) (Figure 1). The rural population would receive most of these benefits (US\$ 5.32 billion).

Deforestation would provide benefits of merely US\$ 7 billion (Figure 1) which would mainly increase the income of the industrial sector. But their growth would come at a substantial social cost: greater exposure to floods and erosion, the reduction of water quality and loss of income from wildlife and non-timber forest products. The decline in ecosystem services would cause a loss for the rural population of US\$2.17 billion when compared to the conservation scenario. Local governments would face losses of US\$ 85 million. Furthermore, the benefits for industry from deforestation would be likely to decline sharply after the 30 year period when forests are lost, while conservation and selective use would maintain the benefits for all stakeholders into the future.

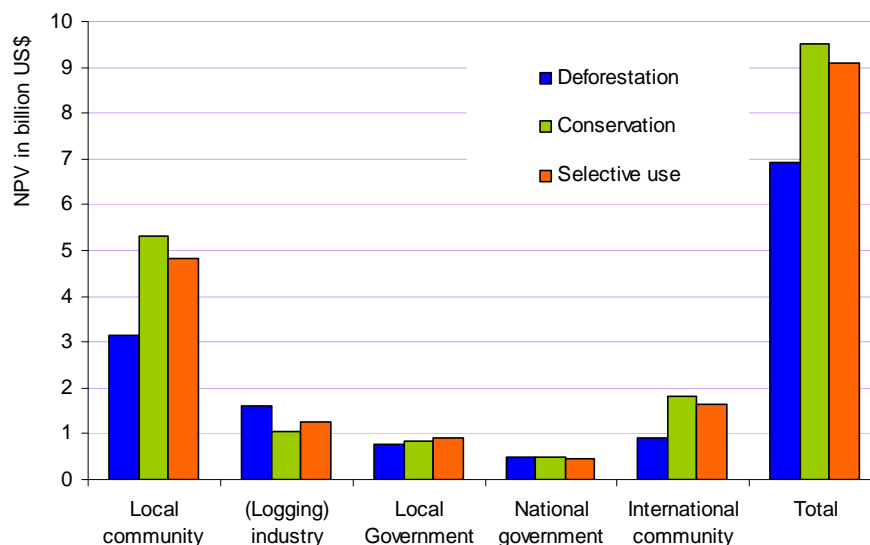


Figure 1: Benefit distribution among stakeholder under different land use scenarios in the Leuser Ecosystem (25,000 sq km), Indonesia, in Net Present Value (NPV) in billion US\$ over 30 years, at a discount rate of 4%.

## **What policy uptake resulted from examining the ecosystem services?**

The valuation exercise demonstrates that logging the tropical forest in the province of Aceh not only works against overall economic growth and development but also produces a negative impact on hundreds of rural forest dwelling communities.

The findings of the study were disseminated at various meetings with the governor of Aceh, the forest department and the local government. A presentation at the provincial parliament was planned but failed due to political unrest. Since there was no leadership among policy makers for sustainable forest management and conservation, the economic arguments were not directly taken up (van Beukering, pers. comm.).

Deforestation was seen to provide cash returns whereas 'protection against erosion', while measured in terms of monetary estimates, generates less tangible benefits (such as 'future costs saved'). At that time of the study, there was no market for environmental services, such as forest carbon, for raising money. In the aftermath of the tsunami in 2004, a peace settlement was negotiated. Irwandi Yusuf won the first democratic elections and became governor of Aceh in 2007. Due to the strong interest of the governor in conserving the natural resources and improving the livelihood of the poor, he declared a moratorium on all logging activities and commissioned the development of a Green Economic Development and Investment Strategy for Aceh, in short called Aceh Green (2008).

The new governor recognized the earlier efforts for protecting the Leuser ecosystem and commissioned an update of the earlier valuation of the ecosystem services of van Beukering et al. (2003), extending it to the ecosystem services of the entire province. This valuation affirmed that, over the long run (beyond 2020), and at discount rates below 8%, the development path of conservation and sustainable management of the natural resources is economically superior to the exploitative path (logging) (van Beukering et al. 2008).

It takes political leadership to translate these findings into sustainable development strategies. On behalf of the government of Aceh, the private companies Carbon Conservation Pty Ltd and Fauna & Flora International secured funding for forest conservation in the Ulu Masen Ecosystem (north of the Leuser Ecosystem) for Reducing Emissions from Deforestation and Degradation (REDD). Through the protection of the forest, deforestation and the related carbon emissions are avoided and offered as carbon certificates on the carbon market. The project has been rated 'silver' in accordance with the Climate, Community and Biodiversity (CCB) standards. Prevented carbon emissions from avoided deforestation are expected to total 100 million tonnes CO<sub>2</sub> with prices expected to range from 5-20 US\$ per tonne (CCB Standards 2009, FFI 2008). Local communities and local and national governments will primarily benefit from these payments.

However, implementing the Green Development and Investment Strategy and generating benefits in monetary terms takes time. The establishment of fair, effective and transparent schemes for payments for ecosystem services (like carbon and hydrological services) that include communities at the local level remains a challenge.

## **References:**

Aceh Green (2008). Concept Paper, Green Economic Development and Investment Strategy for Aceh, Indonesia, "Aceh Green". [http://www.aceh-eye.org/data\\_files/english\\_format/economic/economic\\_analysis/eco\\_analysis\\_2008\\_07\\_00.pdf](http://www.aceh-eye.org/data_files/english_format/economic/economic_analysis/eco_analysis_2008_07_00.pdf)

CCB Standards 2009. Climate, Community and Biodiversity (CCB) Standards: <http://www.climate-standards.org/projects/index.html>, retrieved on March 27, 2009.

FFI 2008. Flora Fauna International (FFI). Press release from February 29, 2008. [http://www.fauna-flora.org/docs/aceh\\_media\\_release.pdf](http://www.fauna-flora.org/docs/aceh_media_release.pdf), retrieved on March 27, 2009.

Leuser Development Programme Project Fact Sheet 2004. Delegation of the European Commission to Indonesia and Brunei Darussalam, [http://www.delidn.ec.europa.eu/en/newsroom/newsroom\\_5\\_ecifp\\_ldp.pdf](http://www.delidn.ec.europa.eu/en/newsroom/newsroom_5_ecifp_ldp.pdf), retrieved on March 27, 2009.

van Beukering, P.J.H., H.S.J. Cesar, M.A. Janssen (2003). Economic valuation of the Leuser National Park on Sumatra, Indonesia. *Ecological Economics* 44, pp 43-62.

van Beukering, P., K. Grogan, S.L. Hansfort (2008). *An Economic Valuation of Aceh's forests: The road towards sustainable development*. 107pp.