



Combined satellite data shed light on Indonesian deforestation

Annual maps of forest cover in Indonesia reveal that, between 2000 and 2008, almost 10 per cent of forest cover on the islands was lost. Around one fifth of this loss occurred in regions where logging is restricted or prohibited. The new maps will help Indonesia meet the objectives of the UN REDD+ programme, which aims to reduce deforestation and forest degradation.

Tropical forests are important nationally and globally as they contain a large number of species, provide vital ecosystem services and livelihoods for local communities, and sequester large amounts of carbon. Indonesia possesses the third largest remaining area of tropical forest anywhere in the world, but also suffers from high levels of deforestation. To help address this, Indonesia has partnered with a number of donors, in particular Norway. The commitment to reduce deforestation will require accurate data on the condition of Indonesian forests, including the carbon content of their forests and on changes to forest cover on a national scale.

The most widely accepted way to monitor forest cover change at national scale is to use optical remote sensing data from satellites. However, the often-cloudy weather in Indonesia means that satellite images are often obscured. Remote sensing images of moderate resolution images are the most suitable for accurate mapping of forest cover. However the frequency of coverage of a given area at this resolution is rather low and there is a high risk that the area will be covered in cloud. On the other hand images of coarse resolution are collected more frequently – increasing the probability of a cloud free image, but do not provide enough spatial detail to allow an accurate assessment of forest cover. To overcome this, the researchers first combined several years of moderate resolution images from NASA's Landsat satellite into a map showing forest loss as a multi-year total. They then allocated the loss to individual years using the less spatially-detailed annual images from the MODIS (moderate resolution imaging spectroradiometer) sensor on NASA's Terra satellite

They found that 5.39 million hectares of forest were lost between 2000 and 2008, accounting for 9.2 per cent of the original forest cover in 2000. Almost half the detected forest loss took place in two provinces – Central Kalimantan and Riau. In total, 20.1 per cent of deforestation took place in limited production forest (13.6 per cent), conservation areas (2.1 per cent) and watershed protection areas (4.4 per cent): all areas where logging is restricted or banned. The results suggest that deforestation in Indonesia could be greatly reduced if restrictions in these areas were more strictly enforced.

The research also shows that much of the forest loss occurred in areas where temporary or permanent clearing is permitted. The researchers did not differentiate which forest types have been cleared and so were not able to distinguish between areas cleared through harvesting of tree plantations and areas in which natural forests were cleared.

The findings highlight the need for policy makers to use data from several different sources to establish reliably the true impact of policy changes on forest cover. The research relied on multiple, systematically acquired, freely available remote sensing data and it is important that such data streams continue and expand. This is particularly important for nations such as Indonesia which have set ambitious objectives to reduce deforestation and forest degradation.

1. See www.un-redd.org/ and www.norway.or.id/Norway_in_Indonesia/Environment/-FAQ-Norway-Indonesia-REDD-Partnership-/

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