LEARNING FROM MALAYSIAN FORESTS; TOWARDS AN UPGRADED REDD+ INCORPORATING BIODIVERSITY

YAMADA, Toshihiro[1*], OKUDA, Toshinori[1]

[1]Graduate School of the Integrated Arts and Sciences, Hiroshima University, 1-7-1 Higashi-Hiroshima, 739-8521, JAPAN

[*]e-mail: *yamada07@hiroshima-u.ac.jp*

Reducing Emissions from Deforestation and Forest Degradation (REDD+) and the Role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries are topics being discussed in the United Nations Framework Convention on Climate Change as methods for mitigating global warming. No less than 20% of anthropogenic CO^2 emissions arise from changes in land use or deforestation (IPCC, 2007). Furthermore, tropical developing countries such as Brazil and Indonesia are rapidly losing forested areas, and this loss has accounted for the majority of the carbon emissions from land use change worldwide (Houghton, 1999). These facts make it obvious that reducing deforestation in developing countries is an effective way of reducing emissions of greenhouse gases.

Carbon storage is not the only ecosystem service forests provide. Forests provide various other ecosystem services such as timber production, water purification, and slowing runoff by acting as natural dams. Providing the structure necessary for high levels of biodiversity is another important ecosystem service of forests. In particular, tropical forests are well known for their high levels of biodiversity. Many biodiversity hot spots occur in tropical developing countries (Myers et al., 2000) and these include most of the mega-diversity countries (World Bank, 2006).

Data reveal that forests with high carbon stock do not always contain high levels of biodiversity. Therefore, if we concentrate on producing or maintaining forests with high carbon storage capabilities, which can have a high economic value using REDD+ mechanisms, we may lose some level of biodiversity. Clearly, we need to consider biodiversity and avoid impacting biodiversity negatively when conducting REDD+. With this in mind, we explored forest management techniques that both maintain and produce high levels of forest carbon stock as well as high levels of forest biodiversity in two Malaysian forests.

One study site is the Pasoh Forest Reserve, Negeri Sembilan, in peninsular Malaysia. Within the reserve, a forest originally logged under the Malayan Uniform Systems method from 1954 to 1959, is located adjacent to unlogged primary forest. We compare the ecological aspects of an unlogged forest and a forest selectively logged 50 years ago. Our results show that the forest structure, light regimes, tree performance, demography and species composition in the selectively logged forest were different from those in the primary forest. These results suggest that logging cycles shorter than 40–50 years are not advisable in terms of conservation of

biodiversity in Malayan tropical forests. More frequent logging may negatively impact biodiversity in tropical forests.

The other study site is the Temengor Forest Reserve, Hulu Perak, also in peninsular Malaysia. In this reserve, a logging operation was ongoing. We investigated impacts of the logging operation on mammalian and insect biodiversity. Based the results, logging roads have a high negative impact both on mammalian and insect biodiversities. Reducing logging road density and length can help mitigate the loss of biodiversity caused by logging operations. Because logging roads are easily monitored and measured, logging road density and length can be a good indicator of negative impacts to biodiversity caused by logging operations. Finally, we discuss how to incorporate biodiversity into REDD+.