Review of Existing Sustainable Forest Management (SFM)-Based Projects in Indonesia


**Summary**

Since the 13th climate change conference (COP 13) in 2007, sustainable forest management (SFM) has been considered as an option for reducing emissions through REDD+ mechanism. Such international agreement provides a great opportunity for Indonesia to highly involve in the REDD+ mechanism, because Indonesia has abundant forest resources. The REDD+ mechanism through SFM, however, needs to be further investigated because until now there is no real implementation yet. This study was aimed to review the progress of SFM practices and REDD+’s demonstration activity projects in Indonesia, to analyze several SFM scenarios for reducing emissions, and to formulate relevant strategies for reducing emission through SFM.

Forest management in Indonesia has initially focused on the utilization of natural production forests to achieve sustained timber yield. Such forest management practice, which was started on around 1970 through forest concessionary licenses, tended to exploit the natural forest resources that resulted in high deforestation and forest degradation. In the period 1990–2009, the number of forest concessions decreased up to 45%, indicating an unsustain management of the natural production forests. Among 308 concessions, which were still exist until June 2011, only five concessions granted SFM certificates by FSC (Forest Stewardship Council) or LEI (Lembaga Ekolabel Indonesia, the Indonesian Ecolabeling Institute).

Considering the decline of natural forest resources, since 1989 Indonesian government has been developing industrial plantation forests (especially in outside of Java) to fulfill increased demands for timber and to improve productivity of critical lands. Until 2008, total area of plantation forests reached 4.3 million hectares. However, until June 2011 there were only three plantation forest management units certified by LEI.
Community forest management shows a promising progress, which is indicated by the increase of community forest areas in Indonesia, although most of the community forests (approximately 50%) concentrate in Java. Until June 2011, five community forest management units have been certified by FSC and twelve other FMUs were certified by LEI. Until now, forest management practices at natural production forests, plantation forests, and community forests do not integrate yet the potential benefits of carbon sequestration into their management objectives.

The implementation of REDD+ mechanism in Indonesia is still limited to demonstration activities at national, provincial, district, or project level. Currently, there are at least 30 demonstration activity projects in Indonesia that are financially supported by various parties, e.g. Korea, Australia, Germany, United Kingdoms, The United Nations, ITTO (International Tropical Timber Organization), TNC (The Nature Conservancy), and WWF (World Wildlife Fund). The REDD+’s demonstration activity projects were implemented for a duration of 2–5 years.

Commonly, the REDD+’s demonstration activity projects conduct five main activities: 1) determining an appropriate baseline, 2) calculating the emission reduction of a project against the business as usual (BAU) scenario, 3) formulating procedures for monitoring, reporting, and verification (MRV) of emission reduction activities, 4) accounting tradable carbon units, and 5) developing distribution system for the payment of carbon trading to involved parties. Those projects are expected to provide lessons learned on methods and technical implementation of REDD+ mechanism in Indonesia. Until now, however, there is no REDD+’s demonstration activity project implemented in a forest management unit level, which could provide lessons learned for forest managers on how to reduce emission through SFM practices.

To explore the potency of SFM as an option for reducing emission in the REDD+ mechanism, this study developed and analyzed several scenarios for managing natural production forests, plantation forests, and community forests. For natural production forests, a case study in Sari Bumi Kusuma (SBK, Central Kalimantan) concession showed that emission reduction benefits can be gained if forest management unit (FMU) applies a multisystem silviculture (i.e. combination of TPTI and TPTJ systems) coupled with AAC (Annual Allowable Cut) reduction. For 30 years, such scenario could reduce carbon emission up to 447.75 MtCO$_2$e for a total effective area of 119,607.45 ha or an average of 124.78 tCO$_2$e/ha/yr. The emission reduction benefit of such scenario was similar to that of applying TPTI system to the entire effective area, which reduced carbon emission up to 443.82 MtCO$_2$e or an average of 123.69 tCO$_2$e/ha/yr. The FMU would gain lower emission reduction
benefits if it implements either TPTJ system to the entire area (i.e. 83.75 tCO$_2$ e/ha/yr) or a multisystem silviculture without AAC reduction (i.e. 103.48 tCO$_2$ e/ha/yr).

In addition to avoiding deforestation, another effort for reducing emissions is avoiding forest degradation. The case study of teak plantations in KPH Kebonharjo (Perum Perhutani Unit I, Central Java) confirmed that the FMU would gain the highest benefit of emission reduction (i.e. 202,630 tCO$_2$e/yr for KPH Kebonharjo or equal to 11.38 tCO$_2$e/ha/yr) if forest managers can avoid forest degradation. Such scenario, however, seems difficult to implement because teak plantations in Java always experience various disturbances that result in forest degradation. Alternatively, if FMU can control the rate of degradation to less than 2% per year (as occurred in KPH Kebonharjo in the period 1977-1987), the FMU would still gain relatively high benefit of emission reduction (average of 152,450 tCO$_2$e/yr or equal to 8.56 tCO$_2$e/ha/yr). These findings confirmed that avoiding forest degradation is a must to gain more benefits of emission reduction through plantation forests management.

Community forest management can also be used as an option to reduce emission. The case study of community forests managed by Koperasi Hutan Jaya Lestari (KJHL, South Konawe, Sulawesi) showed that KJHL could gain the benefit of emission reduction up to 1.03 MtCO$_2$e for 30 years (average of 34,459 tCO$_2$e/yr) if forest managers increase harvestable diameter limit from 20 cm to 30 cm coupled with replanting of harvested trees. The emission reduction benefit can be increased to a total of 3.1 MtCO$_2$e or average of 103,469 tCO$_2$e/yr if KJHL expands their FMU by recruiting new member, replanting, and regulating harvestable diameter limit.

This study concluded that SFM practice (especially in natural production forests, plantation forests, and community forests) can be used as a promising option for reducing emissions in the REDD+ mechanism. Several strategies for reducing emissions at FMU level are: 1) controlling harvest level, 2) reducing logging damages, 3) minimizing land clearing for infrastructures, 4) eliminating or avoiding forest degradation, 5) conducting rehabilitation or restoration of unproductive areas, 6) tending residual stands to improve regrowth, 7) allocating some portions of production areas to protected areas, 8) selecting appropriate silvicultural systems that increase carbon stocks, and 9) optimizing growing space for maximizing forest biomass. Forest managers, however, need to be aware that trade-offs between emission reduction and sustained timber yield objectives are unavoidable. Incentive systems for forest managers, therefore, need to be formulated to support the implementation of REDD+ mechanism through SFM.
practices.