

Tables and Figures for

Sasaki, N., Yoshida, T. & Yamamoto, H (2009) Implications of climate change agreements on forest management in the Greater Mekong Sub-region. Proceedings of the International Workshop on Strategic Research Framework of NREMC and GMS/UniNet on NREM. Mae Fah Luang University. November 2009. Chiang Rai: 177-186.

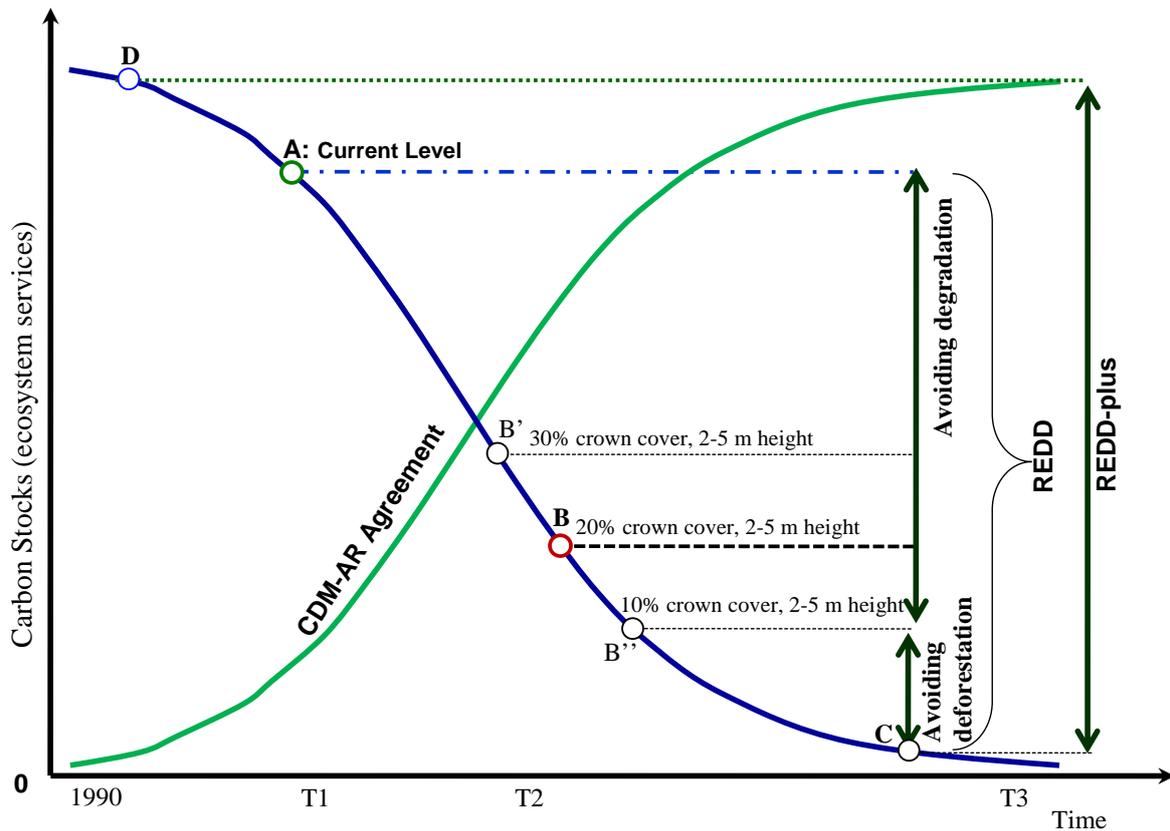


Fig. 1 Current and future climate change agreements and tropical forestry

Note for Fig. 1: Blue curve is the current trend of carbon stocks in tropical natural forest. Under the current definition, carbon stock continues to decline until a point corresponding to a crown cover of 10–30% (either B', B or B''). Deforestation is likely to occur at the point B''. The REDD agreement would stop deforestation i.e. prevent carbon stock from getting below B''. Any carbon stock declining from point A results in forest degradation. Avoiding deforestation and degradation coupled with enhancing carbon stocks from any point between A and B'' to point D is termed REDD-plus (point C to D). T1 to T2 and T1 to T3 are the commitments and ensured periods. Carbon stored in the forest during the T1 to T3 period should not fall below that in the T1 to T2 period. Green curve is for carbon stock resulted from CDM-AR. It increases from almost zero (no forest before 1990) to more carbon until the forest is harvested.

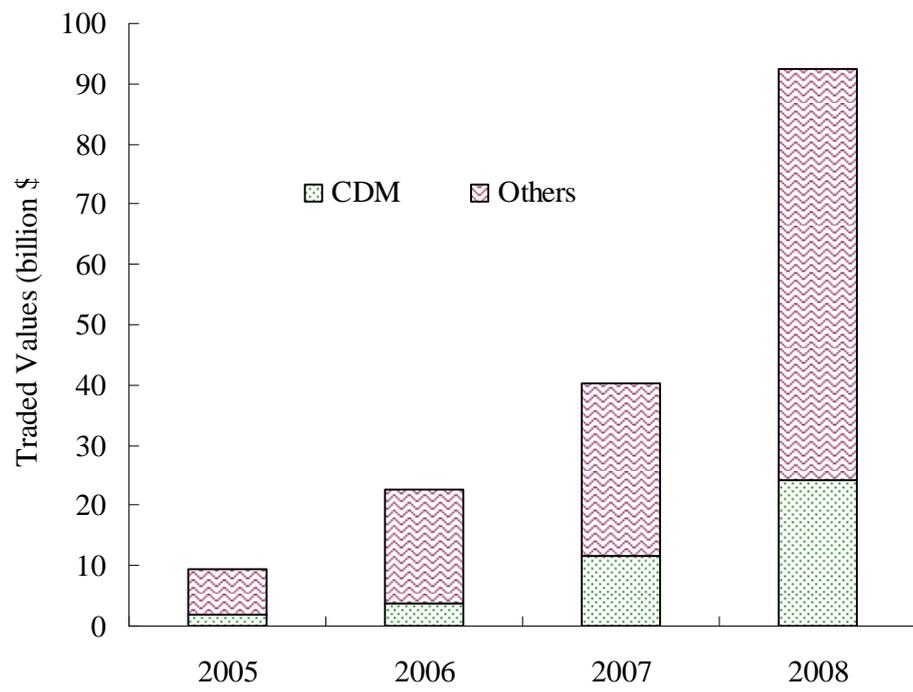


Fig. 2 Trend of global carbon markets (2005–2008)

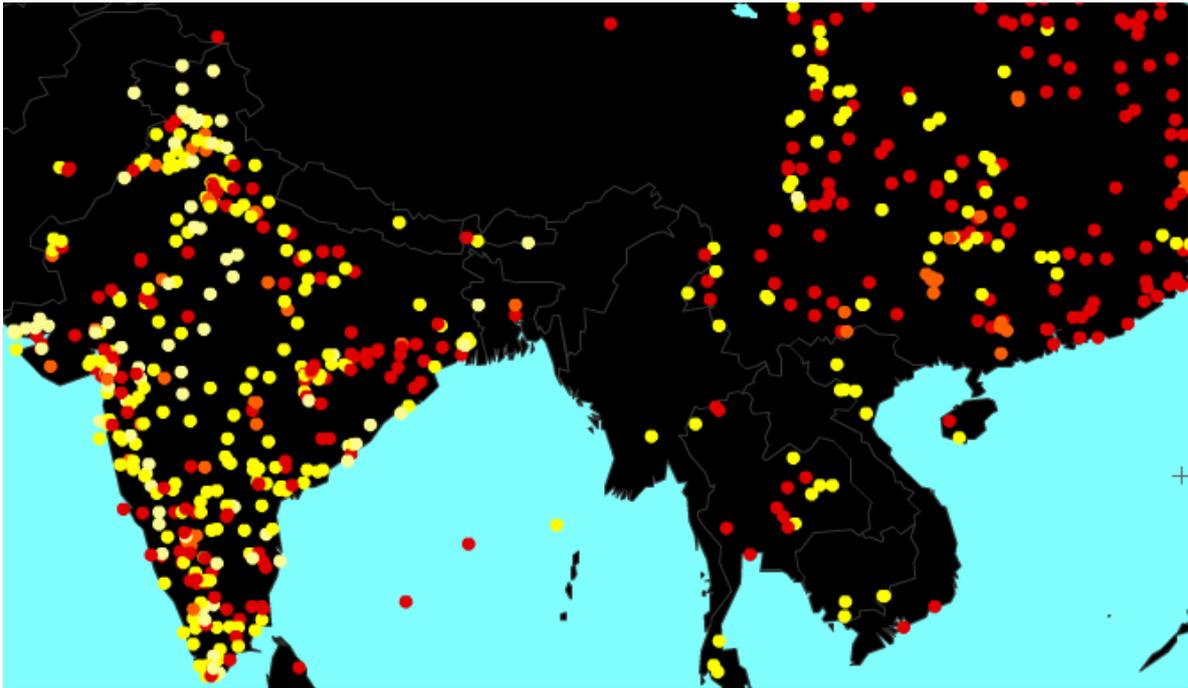


Fig. 3 Locations of CDM projects in Asia and the GMS

Table 1 Forest area change some countries in GMS (1990-2005)

Country	1990	2005	Annual Loss (1990-2005)		Annual Carbon Emissions
	('000 ha)	('000 ha)	('000 ha)	(%)	(million tons*)
Cambodia	13,013.0	10,506.0	-167.1	-1.3	33.4
Laos	17,318.0	16,366.0	-63.5	-0.4	12.7
Myanmar	39,613.0	33,071.0	-436.1	-1.1	87.2
Thailand	18,605.0	17,619.0	-65.7	-0.4	13.1
Viet Nam	10,330.0	15,626.0	353.1	3.4	-70.6
Total	98,879.0	93,188.0	-379.4	-0.4	75.9

Source: Forest area is taken from FAO (2006)

Note: * assumed that 1 ha of forest in GMS contains 200 ton C of aboveground and belowground carbon

References

- Bunker, D.E., Declerck, F., Bradford, J.C., Colwell, R.K., Perfecto, I., Phillips, O.L., Sankaran, M., Naeem, S., 2005. Species loss and aboveground carbon storage in a tropical forest. *Science* 310 (5750), 1029- 10310.
- FAO, 2006. Global forest resources assessment 2005. Progress towards sustainable forest management. FAO Forestry Paper 147, Rome.
- Gibbs, H.K., Brown, S., Niles, J.O. & Foley, J.A. 2007. Monitoring and estimating tropical forest carbon stocks: making REDD a reality. *Environ Res Letters* 2, 045023.
- Gullison, F.R., Frumhoff, C.P., Canadell, G.J., Field, B.C., Nepstad, C.D., Hayhoe, K., Avissar, R., Curran, M.L., Friedlingstein, P., Jones, D.C. & Nobre, C. 2007. Tropical forests and climate policy. *Science* 316, 985–986.
- Houghton, R.A., 2003. Revised estimates of the annual net flux of carbon to the atmosphere from changes in land use and land management 1850-2000. *Tellus* 55B, 378–390.
- Intergovernmental Panel on Climate Change (IPCC), 2007. Climate Change 2007: The Physical Science Basis: Summary for Policymakers
<http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>
- Meyfroidt, P., & Lambin, E.F., 2008. Forest transition in Vietnam and its environmental impacts. *Glob Change Biol* 14, 1-8.
- Peña-Claros, M., Fredericksen, T.S., Alarcón, A., Blate, G.M., Choque, U., Leño, C.,

- Licona, J.C., Mostacedo, B., Pariona, W., Villegas, Z. & Putz, F.E., 2008. Beyond reduced-impact logging: Silvicultural treatments to increase growth rates of tropical trees. *Forest Ecol. Manage.* 256, 1458-1467.
- Sasaki, N., 2006. Carbon emissions due to land-use change and logging in Cambodia- a modeling approach. *Journal of Forest Research* 11, 397-403
- Sasaki, N., Putz, F.E., 2009. Critical need for new definitions of forest and forest degradation in global climate change agreements. *Conservation Letters* DOI: 10.1111/j.1755-263X.2009.00067.x
- Sasaki, N., Putz, F.E., Knorr, W., Davies, S.J., Durst, P., and Asner, G., 2009. Restoring degraded natural forests in the tropics to mitigate global climate change. *Environmental Research Letters* (under reviews)
- Shono, K., Cadaweng, E.A. & Durst, P.B., 2007. Application of assisted natural regeneration to restore degraded tropical forestlands. *Restoration Ecol.* 15, 620-626.
- Villegas, Z., Peña-Claros, M., Mostacedo, B., Alarcón, A., Licona, J.C., Leño, C., Pariona, W. & Choque, U., 2009. Silvicultural treatments enhance growth rates of future crop trees in a tropical dry forest. *Forest Ecol. Manage.* 258 (6), 971 – 977