



## ONLINE LIBRARY

([www.onekhmer.org/onlinelibrary](http://www.onekhmer.org/onlinelibrary))

**Title:** Sustainable Forest Governance in the Asia-Pacific Region: Has REDD+ Adequately Addressed Drivers of Deforestation and Forest Degradation?

**Name of Author** Nguon Pheakkdey

**Name of University** Clark University

**Country of Study** United States

**Major** Human-Environment Geography

**Degree** PhD

**Course Title**

**Type of Document** Policy Brief, Development Research Forum

**Year** 2014



# Sustainable Forest Governance in the Asia-Pacific Region: Has REDD+ Adequately Addressed Drivers of Deforestation and Forest Degradation?

By Nguon Pheakkdey



Development Research Forum

Policy Brief No. 06, August 2014

## Sustainable Forest Governance in the 21<sup>st</sup> Century

A substantive review of contemporary forest ecology and management, landscape ecology and conservation biology literature suggests that natural disturbances are fundamental to the structure and function of many forest ecosystems. Thus sustainable forest management should be based on the ecological understanding of the processes that drive periods of gradual and relatively rapid change, the latter being driven by disturbances (Moore et al. 2008).

The recognition of the dynamic character of ecosystems and the important role of disturbances in driving these dynamics has been an important shift in perception over the last few decades among scientists and resource managers (Pickett and White 1985). It is therefore important to ensure that modern initiatives aiming at sustainable management of natural resources are based on both the best possible socioeconomic understanding and the best available ecological understanding.

In that context, this policy brief explores the extent to which the overarching framework within which identified drivers of deforestation and forest degradation are examined and understood for the purposes of REDD+ initiatives, supported by the World Bank Forest Carbon Partnership Facility (FCPF), is consistent with contemporary scientific knowledge on natural disturbances. REDD+ stands for reducing emissions from deforestation and forest degradation in developing countries, plus activities that contribute to the removal of emissions through conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks (Nguon and Kulakowski 2013).

For its policy proponents, REDD+ is based on the simple notion that countries willing and able to reduce emissions from deforestation and forest degradation by strengthening or establishing new forest conservation institutions and

policies should be financially compensated for doing so (UN-REDD Programme and UNEP-WCMC 2010). The possibility of significant international payment has attracted more than 50 tropical countries to pilot over 300 REDD+ projects (CIFOR 2012).

In short, REDD+ represents a form of global environmental governance that transcends multiple decision-making structures and organisations, brings together actors with diverse interests, and translates existing and new policies into practices, appropriate for the purposes of REDD+. It is essential to distinguish between REDD+ initiatives that follow the decisions of the United Nations Framework Convention on Climate Change (UNFCCC) and are supported through start-up funding from the FCPF, and other REDD+ initiatives that are established outside the auspices of the UNFCCC and funded through voluntary market mechanisms.

This policy brief focuses on examining drivers of deforestation and forest degradation identified in the FCPF-REDD+ participating countries in the Asia-Pacific region, which include Cambodia, Indonesia, Laos, Nepal, Papua New Guinea, Thailand, Vanuatu and Vietnam. The argument is that the design of the FCPF-REDD+ programme has not adequately addressed natural disturbances; therefore, the potential contribution of REDD+ to sustainable forest governance in the Asia-Pacific region is scientifically contestable.

## Natural Disturbances and Their Importance for REDD+

Disturbance in ecology is defined variously according to the context. Pickett and White (1985: 7) defined disturbance as “any relatively discrete event in time that disrupts ecosystems, community, or population structure and changes resources, substrate availability, or the physical environment.” Disturbances in forest communities include fires, insect outbreaks, storms, floods and other events

---

This policy brief is adapted from a peer-reviewed article by Nguon Pheakkdey and Dominik Kulakowski published in *Environmental Science and Policy* 33 (4): 332–345. Nguon Pheakkdey is a doctoral candidate at Clark University, lecturer at Royal University of Phnom Penh, Fulbright and IPCC Research Fellow. This publication may be cited as: Nguon Pheakkdey (2014), *Sustainable Forest Governance in the Asia-Pacific Region: Has REDD+ Adequately Addressed Drivers of Deforestation and Forest Degradation*, Development Research Forum, Policy Brief No. 6, August 2014 (Phnom Penh: CDRI), [www.cdri.org.kh/download.htm](http://www.cdri.org.kh/download.htm)

that alter demographic processes and change resource availability or the physical environment (Hobbs and Huenneke 1992). Pickett and White (1985) also recognised that some natural disturbances, such as fires and landslides, might have their origins in human activities. Recent studies have generally made the distinction between human-induced and natural disturbances based on the origin of the disturbance (Raffa et al. 2008). For example, while fire caused by lightning is considered a natural disturbance, fire used for agricultural activities might be considered an anthropogenic disturbance.

There are several reasons for the importance of understanding natural disturbances and their relevance to REDD+ policy design. First, natural disturbances are a primary cause of spatial heterogeneities or subregional variations in ecosystems, influencing competition, natural environment and resource availability (White et al. 2000). Second, disturbances often influence ecosystem composition and structure long after their occurrence, and thus understanding ecosystems requires an understanding of their disturbance history (White and Jentsch 2001). Third, natural disturbances have been important in maintaining biodiversity by acting as evolutionary forces and causing adaptations in the plants and animals exposed to them (Christensen et al. 1989).

As such, ecologists no longer consider natural disturbance as extraordinary and merely destructive forces; they acknowledge the generality of the occurrence of disturbances and the significance of their influence as part of normal ecosystem development (White and Jentsch 2001). Furthermore, natural and human disturbances interact (Kulakowski and Veblen 2006), so studying the impact of disturbances on both natural and cultivated landscapes must take into account the synergistic effects of both natural and human-induced disturbance regimes.

### **REDD+ in Asia-Pacific: Incomplete Account of Drivers of Deforestation and Degradation**

Content analysis was conducted of the national documents that countries have submitted to the FCPF. These national policy documents are openly available on the FCPF website.<sup>1</sup> The geographical distribution of REDD+ project sites in Asia and the Pacific is uneven, varying within and across regions, and participant countries are in different phases of the REDD+ process. For example, some countries have just completed their Readiness Plan Idea Notes,

while others have finished their Readiness Preparation Proposals.

This study drew upon literature on land-use and land-cover change to code (using NVivo 10 qualitative data analysis software) the drivers of deforestation and forest degradation in the eight countries into two broad categories: proximate and underlying (Geist and Lambin 2002). Proximate causes include human activities or immediate actions at the local level, such as agricultural expansion, that originate from intended land use and directly affect forest cover. Underlying driving forces on the other hand are fundamental social processes, such as human population dynamics or agricultural policies, which underpin the proximate causes and either operate at the local level or have an indirect impact from the national or global level (Geist and Lambin 2002). Particular attention was paid to the identification and description of natural disturbances that were identified and discussed in these national policy documents (e.g., insect outbreaks, fires and other ecological factors).

Drivers of deforestation and forest degradation that were identified in each of the REDD+ countries are summarised in Table 1. Ecological factors, in particular natural disturbance regimes, were not identified as one of the factors that lead to deforestation and forest degradation. In other words, none of the eight countries made any reference to natural disturbances in their identification of drivers of deforestation and forest degradation. This is alarming because natural disturbances have increasingly been recognised by forest ecologists and conservation biologists as critical ecosystem processes that shape landscapes, accentuate the inherent complexity in patterns of landscape cover, and create habitats for species (Lindenmayer and Hunter 2010).

These results are consistent with other recent studies that have suggested that the identification of drivers of deforestation and forest degradation in REDD+ countries lacks consideration of natural disturbances (Angelsen et al. 2012). REDD+ initiatives, therefore, might have promising implications that are based on a nuanced understanding of the dynamic interactions between socio-political and economic variables. However, it is less clear that the understanding underlying these projects pays adequate attention to the potential importance of knowledge on the structure and function of the ecological systems in which the projects are proposed, in particular natural disturbances.

<sup>1</sup> World Bank FCPF: [www.forestcarbonpartnership.org/fcp/node/203](http://www.forestcarbonpartnership.org/fcp/node/203)

Table 1: Drivers of Deforestation and Forest Degradation in FCPF REDD+ Participant Countries from the Asia-Pacific Region

Countries	Drivers of deforestation and forest degradation	
	Proximate	Underlying
Cambodia	<p>Unsustainable and illegal logging</p> <p>Unsustainable wood fuel collection</p> <p>Clearance for agriculture</p> <p>Expansion of settlements</p>	<p>Population increases</p> <p>Migration into forest areas</p> <p>Social norms (claiming land through utilisation)</p> <p>Increasing accessibility of forest areas</p> <p>Regional demand for resources</p> <p>Weak forestland tenure</p> <p>Lack of a fair and transparent conflict resolution mechanism</p> <p>Insufficient implementation of land-use planning</p> <p>Low economic benefits provided by forests at national level in comparison with alternatives</p> <p>Low awareness of environmental roles of forests</p>
Indonesia	<p>Rapidly growing forest plantation and pulp and paper industry</p> <p>Oil palm plantation</p> <p>Forest encroachment</p> <p>Unsustainable levels of logging in legal forest concessions</p> <p>Illegal logging on both small and large scales</p>	<p>Population increase and increasing demand for food</p> <p>Unplanned encroachment from local communities or other commercial forest users</p> <p>Insufficient incentives for communities and governments to maintain protected areas</p> <p>Low capacity of institutions charged with managing the protected areas</p>
Laos	<p>Pioneering shifting cultivation</p> <p>Infrastructure/hydropower developments</p> <p>Unsustainable wood extraction</p> <p>Agricultural expansion and the establishment of industrial tree plantations</p>	<p>Weak control and monitoring of forestry activities</p> <p>Growing domestic/international demand</p> <p>Weak governance, insufficient capacity of local authorities</p> <p>Inadequate extension services, inadequate budget allocation</p> <p>Insufficient availability of information and appropriate technologies</p> <p>Consumption pattern especially in neighbouring countries and overseas</p> <p>Weaknesses in regional/international rules and cooperation</p> <p>Insecure land tenure</p>
Nepal	<p>Illegal and unsustainable harvest of forest products</p> <p>Human-induced forest fires</p> <p>Encroachment</p> <p>Overgrazing</p> <p>Infrastructure development</p> <p>Resettlement</p> <p>Expansion of invasive species</p>	<p>Inefficient forest product use</p> <p>Weak governance and governance vacuum</p> <p>Inefficient distribution mechanisms for timber and firewood</p> <p>Market failure</p> <p>Poverty and lack of livelihood opportunities</p> <p>High cross-border demand for forest products</p> <p>Insecure tenure</p> <p>Insufficient technical inputs</p> <p>Poverty and lack of livelihood opportunities</p> <p>New economic growth prospects (e.g., oil and gas, transmission lines, cement factory, airport, hydropower dam)</p> <p>Poorly enforced planning regulations</p> <p>Lack of proven eradication practices</p>

Papua New Guinea	Shifting cultivation Commercial logging Large-scale commercial agriculture Human-induced forest fires Mining and petroleum exploration and development Infrastructure development Settlements and urbanisation Natural sources (earthquakes, volcanic eruptions, tectonic movements, landslips, and flooding)	Not specified in the document
Thailand	Shifting cultivation and forest fires Land resettlement, dam and road construction and conversion to agricultural use Demand for land for subsistence farming and rubber plantation Commercial agriculture, physical infrastructure, land development for tourism	Not specified in the document
Vanuatu	Subsistence land use Conversion to agriculture and subdivisions Activities of international logging companies Urban and peri-urban infrastructure development	Need stronger link between forestry and agriculture through agroforestry Institutions need to meet the development needs of the forest sector while allowing natural forests to remain protected where possible and appropriate
Vietnam	Conversion of forest into agricultural land Infrastructure development and hydropower plans Unsustainable and illegal logging Forest fires from slash and burn practices	National and provincial policies and plans for expansion of agriculture Forest classification systems and procedures Weak law enforcement and land encroachment with impunity Undervaluation of forest goods and services Poverty alleviation Traditional agricultural practices Population growth and demand for energy Poor planning with inadequate attention to environmental impacts Lack of appropriate mitigation and compensation measures Weak accountability mechanisms for planning and approval of development projects Lack of legal safeguards Poor awareness and knowledge, data gaps

### Policy Implications and Recommendations

Natural disturbances vary from the removal of a single tree to the synchronous death of the whole forest (Peet 1991). Therefore, this policy brief argues that understanding the disturbance regime of an ecosystem is as important in the design and management of REDD+ forestry projects as it is for other forms of forest management (Baker 1992). Ignoring the potential role natural disturbances may play in a given system might lead to an implicit assumption that

natural disturbances are not important and that, in effect, ecosystems are static.

Such oversights may lead to unforeseen surprises because forest disturbances affect regeneration, carbon dynamics and other aspects of structure and function, and because they can compound the effects of anthropogenic disturbances (McKenzie et al. 2004). Indeed, from this alone, it follows that it is impossible to realistically predict

likely carbon emissions or future forest conditions without understanding the disturbance (natural and anthropogenic) regime in any given forest ecosystem.

While it is acknowledged that it is important that REDD+ initiatives address the institutional policies, political-economic conditions and social settings that drive deforestation and degradation, this policy brief argues that sufficient attention must be paid to the natural disturbance regimes, including fires, droughts, hurricanes, pathogen and insect outbreaks, of the proposed REDD+ project sites.

It is beyond the scope of this review to suggest country-specific recommendations on how natural disturbances should be integrated into the design of REDD+ policies and measures. Such concrete recommendations would be appropriate after empirical studies on natural and human-induced drivers of deforestation and forest degradation have been conducted in that country. However, based on reviews of current literature, it could be proposed that the integration of natural disturbances into the reconceptualisation of the drivers of deforestation and degradation within REDD+ participating countries in the Asia-Pacific region would require the following four steps:

1. Identification and review of literature on natural disturbances in potential REDD+ countries, and description of those disturbance regimes. The amount of such literature varies across countries and regions. Thus, new empirical research would be required for some countries.
2. Establishment of a spatial and temporal frame of reference to compare the different datasets by documenting how the observations within the existing literature and empirical fieldwork were conducted.
3. Utilisation of the understanding of disturbance regimes to determine the appropriate size of the areas to be set aside to account for natural disturbances in a given country or region. That size will vary spatially across ecosystems and biophysical settings, and temporally with climatic fluctuations.
4. Determination of the spatial and temporal patterns of the dominant natural and human-induced disturbance regimes, and the integration of this understanding with the institutional, political, economic and social causes of deforestation and degradation.

## References

- Angelsen, A., M. Brockhaus, W. Sunderlin and L. Verchot (eds.) (2012), *Analysing REDD+: Challenges and Choices* (Bogor, Indonesia: Center for International Forestry Research)
- Baker, W. (1992), "The Landscape Ecology of Large Disturbances in the Design and Management of Nature Reserves", *Landscape Ecology*, 17 (3): 181–194
- Christensen, N., J. Agee, P. Brussard, J. Hughes, D. Knight, G. Minshall, J. Peek, S. Pyne, F. Swanson, J. Thomas, S. Wells, S. Williams and H. Wright (1989), "Interpreting the Yellowstone Fires of 1988", *Bio Science*, 39 (10): 678–685
- CIFOR, Center for International Forestry Research (2012), "Forests and Climate Change: The Global Comparative Study of REDD+", <http://www.forestsclimatechange.org/global-comparative-studyon-redd.html>
- Geist, H., and E. Lambin (2002), "Proximate Causes and Underlying Driving Forces of Tropical Deforestation", *Bio Science*, 52 (2): 143–150
- Hobbs, R., and L. Huenneke (1992), "Disturbance, Diversity, and Invasion: Implications for Conservation", *Conservation Biology*, 6 (3): 324–337
- Kulakowski, D., and T. Veblen (2006), *Historical Range of Variability for Forest Vegetation of the Grand Mesa National Forest* (Boulder, CO: USDA Forest Service)
- Lindenmayer, D., and M. Hunter (2010), "Some Guiding Concepts for Conservation Biology", *Conservation Biology*, 24 (6): 1459–1468
- McKenzie, D., Z. Gedalof, D. Peterson and P. Mote (2004), "Climatic Change, Wildfire, and Conservation", *Conservation Biology*, 18 (4): 890–902
- Moore, S., T. Wallington, R. Hobbs, P. Ehrlich, C. Holling, S. Levin, D. Lindenmayer, C. Pahl-Wostl, H. Possingham, M. Turner and M. Westoby (2008), "Diversity of Current Ecological Thinking: Implications for Environmental Management", *Environmental Management*, 43 (1): 17–27
- Nguon P., D. Kulakowski (2013), "Natural Forest Disturbances and the Design of REDD+ Initiatives", *Environmental Science and Policy*, 33 (4): 332–345

Peet, R. K. (1991), “Case Studies in Natural Systems: Lessons from Nature”, in L. Real and J. Brown (eds.), *Foundations of Ecology: Classic Papers with Commentaries* (Chicago, IL: University of Chicago Press)

Pickett, S., and P. White (1985), *The Ecology of Natural Disturbance and Patch Dynamics* (London; New York: Academic Press)

Raffa, K., B. Aukema, B. Bentz, A. Carroll, J. Hicke, M. Turner and W. Romme (2008), “Cross-scale Drivers of Natural Disturbances Prone to Anthropogenic Amplification: The Dynamics of Bark Beetle Eruptions”, *Bio Science*, 58 (6): 501–517

UN-REDD Programme and UNEP-WCMC (2010), *Beyond Carbon: Ecosystem-based Benefits of REDD+* (Geneva: UN-REDD)

White, P., J. Harrod, J. Walker and A. Jentsch (2000), “Disturbance, Scale and Boundary in Wilderness Management”, in D. Cole and S. McCool (eds.), *Proceedings: Wilderness Science in a Time of Change*, Proceeding RMRS-P-000 (Ogden, UT: US Department of Agriculture, Forest Service)

White, P., and A. Jentsch (2001), “The Search for Generality in Studies of Disturbance and Ecosystem Dynamics”, *Progress in Botany*, 62:399–450

### About the DRF

The Development Research Forum (DRF) of Cambodia was established following the All-Partners Forum organised by the International Development Research Centre (IDRC) of Canada in September 2007.

The DRF vision is of a high capacity, professional and vibrant Cambodian development research community. Its goal is to support and strengthen the capacity of the Cambodian development research community.

The DRF partnership involves the Cambodia Development Resource Institute (CDRI), Cambodian Economic Association (CEA), Learning Institute (LI), National Institute of Public Health (NIPH), Royal University of Agriculture (RUA), Royal University of Phnom Penh (RUPP), Supreme National Economic Council (SNEC) and the International Development Research Centre (IDRC) of Canada.

In DRF Phase II 2012-15, with financial support from IDRC, the partners intend to work together to build research culture and capacity and to share research knowledge through workshops, policy roundtables and symposiums as well as training and online discussion ([www.drfcambodia.net](http://www.drfcambodia.net)) on six research themes: growth and inclusiveness, governance of natural resources, social policy on education, social policy on health, agricultural development, and Cambodia and its region.

### A Partnership of



គណៈកម្មាធិការសេដ្ឋកិច្ចជាតិ  
Supreme National Economic Council



Canada

The responsibility for opinions expressed in articles, studies and other contributions rests solely with their authors, and publication does not necessarily constitute an endorsement by CDRI.

**CDRI – Cambodia’s leading independent development policy research institute**

☎ 56 Street 315, Tuol Kork ☒ PO Box 622, Phnom Penh, Cambodia

☎ (855 23) 881 384/881 701/881 916/883 603 ☎ (855 23) 880 734

Email: [cdri@cdri.org.kh](mailto:cdri@cdri.org.kh) Website: [www.cdri.org.kh](http://www.cdri.org.kh)