REDD+: An Effective Climate Change Mitigation Strategy?

An Examination of Common-Pool Resource Management Systems of the REDD+ Pilot Program in Cambodia

By

MADELEINE WORK

Name of faculty advisor, Henrik Selin

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Introduction

The next hundred years will exhibit drastic changes in climate, including temperature increase, erratic precipitation patterns, and more extreme storms under all emissions scenarios (IPCC, 2014). The large majority of estimated damage caused by future climate change will be disproportionately distributed, where disadvantaged people and communities will endure the majority of damage. It is clear human influence is responsible for the rapid increase of atmospheric carbon dioxide, methane and nitrous oxide concentrations, which are at the highest levels they have ever been (IPCC, 2014).

The international community recognized climate change as a global concern in the early 90s, whereby they created an international treaty – the United Nations Framework Convention on Climate Change (UNFCCC) – to facilitate cooperation on mitigating the effects of climate change. By 1997, the UNFCCC parties adopted the Kyoto Protocol, a legally binding treaty that required industrialized nations and countries with economies in transition (Annex I countries) to adhere to an average of five-percent reduction of greenhouse gas emissions from 1990 levels. The biggest driver of rising atmospheric concentrations of carbon dioxide is the burning of fossil fuels to generate electricity and power transportation vehicles, accounting for 80 percent of global CO_2 emissions (Lyster,2013). Land use changes, including deforestation and forest degradation, are the second largest source of anthropogenic CO_2 emissions, responsible for nearly 20 percent of current carbon dioxide levels (CIFOR, 2009). A small component of the Kyoto Protocol gives parties the option of counting afforestation and

reforestation towards the target emissions level; however, there was no option for parties to reach their target emissions level through preventing future deforestation or forest degradation (United Nations, 1998).

REDD/REDD+ seeks to mitigate high deforestation and forest degradation rates by compensating national governments and subnational actors in return for demonstrable reductions in carbon emissions from deforestation and forest degradation and enhancements of terrestrial carbon stocks. The 'plus' incorporates biodiversity conservation and protection of indigenous peoples' rights. On the surface, this initiative seems universally beneficial. However, many doubt the REDD+ Program can provide as much positive change as it claims. Some criticize REDD+ for overestimating the amount of carbon its program actually sequesters, and argue the high cost of the program is not worth the minimal paybacks (Milne and Chervier, 2014). Others believe REDD+ over-values carbon sequestration, which will result in loss of tenure security rights and biodiversity in the long term (Malhi and Marthews, 2013; Venter et al, 2009; Putz and Redford 2009; Agrawal and Chattre 2008; Baird, 2014). This paper will examine these two arguments in an effort to ask: is REDD+ an effective climate change mitigation strategy? Are the mechanisms under REDD+ sufficient to both maximize carbon sequestration and also improve biodiversity and local peoples' quality of life? This paper seeks to answer this question using a case study of a recently implemented REDD+ pilot program in Cambodia.

In 2008, 13 community forests in Oddar Meanchey, the northwestern-most province in Cambodia, welcomed Cambodia's first REDD+ program. These 13 community

forests vary in terms of user participation, size, deforestation rates, and so forth. For example, in the Song Rukavorn forest – the largest of the community forests located in the middle of Oddar Meanchey province – deforestation rates have dropped to almost nothing (compared to a provincial-wide rate of more than two percent per year) (Bradley 2009). The Song Rukavorn forest is colloquially known as the Monk's Forest, as the success of the forest can be largely attributed to the Venerable Bun Saluth and other monks from the Samrong Pagoda. Other community forests are unable to report the same kind of success, where community forest law continues to be violated. This paper will explore the unique characteristics and success levels of individual community forests in order to open a discussion into the overall success of REDD+.

This paper uses a number of secondary sources from peer-reviewed journals and books that examine the effectiveness of REDD+ in other regions around the globe and in Cambodia. It additionally looks at publications from Non-Governmental Organizations (NGOs) for relevant data and observations. Publications from the UN – especially the UNFCCC, the Food and Agriculture Organization (FAO), and the UN-REDD Programme – are also used for data and background on international treaties, agreements, programs, etc. Song Rukavorn Forest is mostly analyzed using interviews conducted by the author with local Cambodians in Khmer with help from a local research assistant. The author interviewed eight community forest members and four community forest management committee members from three different villages within in the Monk's Forest; three monks, including the Venerable Bun Saluth, in the Samrong Pagoda; and a Forestry Administration official. These interviews were conducted in Khmer, the native language

of Cambodia; the author then personally translated the interviews into English. This paper uses other recent research on community forestry in Oddar Meanchey to construct data from the other forests.

In the first section, the paper will give an overview of current knowledge on climate change, history of cooperation on mitigating climate change, the history of the REDD+ program specifically, and criticisms for REDD+. Many critics believe REDD+ lacks the mechanism to both increase forest carbon stocks and also conserve biodiversity and protect tenure rights. Others criticize REDD+'s reliance on corrupt governments within countries where deforestation is most rampant. The section will continue by outlining the critique on the dynamic between bureaucracy and market-based mechanisms, through an examination of re-centralization of forest governance and payment for environmental services (PES). The first section will conclude with a comment on long-enduring common-pool resource management trends.

The second section will be an in-depth analysis of the subject area in Cambodia. It first gives background on forests in Cambodia, the history of community forestry, drivers of deforestation in Cambodia, and a brief history of REDD+ in Cambodia. This precludes a comparison of the highly acclaimed "Monk's Forest" in Oddar Meanchey to eleven other less-successful community forests through the prism of Basurto and Ostrom's theory on the shared characteristics of communities with successfully managed common-pool resources. This section will conclude with a discussion of how the bureaucracy of REDD+ will adapt to local conditions in Cambodia, and what this means for the future of REDD+ both in Cambodia and globally.

REDD+: History, Criticisms, and Potential Solutions

History

The latest IPCC report (2014) says that the period from 1983 to 2012 was the warmest 30-year stretch of the last 1,400 years in the Northern Hemisphere. As a result, polar ice caps are melting, sea levels are rising, and weather patterns are becoming more extreme and less predictable. The report states that due to drastic changes in fossil fuel consumption patterns, the effects of climate change will only continue to increase in intensity over the next half century. The result will be detrimental to natural and human systems.

The Kyoto Protocol, the world's first climate-change agreement with binding national emission reduction targets, is an attempt to mitigate the effects of climate change. The Kyoto Protocol differentiates between Annex I countries and other countries. The former are industrialized countries and countries with economies in transition that were required to meet binding national emission reduction targets by 2012, the latter refers to developing countries, particularly those that are especially vulnerable to the adverse impacts of climate change. Many Annex I countries choose to meet their target by reducing domestic emissions through enhancing energy-use efficiency, improving waste management methods, implementing policies to reduce emissions from the transport sector, etc. (UN, 1998).

In addition to reducing domestic emissions, Annex I countries also have the option of designing and implementing carbon reduction projects in developing countries under the Clean Development Mechanism (CDM). Each project can earn certified

emissions reductions (CER), each equivalent to one ton of CO_2, which can then be traded and sold and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol (CDM, nd). The CDM was institutionalized under the UNFCCC and prominently set-up in the Kyoto Protocol with the primary objectives of providing a cost-effective mechanism for the developed world to offset greenhouse gas emissions and to contribute to sustainable development by transferring new low-carbon technologies to developing countries that host CDM projects (Lederer 2011).

The CDM gives the opportunity for Annex I countries to include carbon emissions from afforestation and reforestation projects undertaken in development as part of their national emission targets; however, afforestation and reforestation projects represent less than one percent of all CDM projects due to high costs and administrative problems (Thomas et al, 2009). Furthermore, the CDM limits industrialized countries to earning carbon credits only through afforestation and reforestation projects; that is, any efforts towards protecting existing carbon pools (i.e. preventing deforestation and forest degradation) cannot be included in domestic emission reduction targets. This was excluded for a number of reasons. First, problems of additionalitiy, permanence, and leakage make it difficult to determine actual effectiveness of any initiatives taken to reduce rate of deforestation and forest degradation (Agrawal et al, 2011). *Additionality* refers to payments for reduced emissions that may have occurred even without payments; *Permanence* refers to the risk that current emissions reductions may be offset via higher levels of deforestation and degradation in the future (i.e. a ton of sequestered carbon is only of benefit to the atmosphere as long as it remains

sequestered; once a tree is felled it no longer benefits the atmosphere and is, therefore, 'non-permanent'); *Leakage* refers to emissions reduced in one location that shifted to another location (Agrawal et al., 2011).

Secondly, accurately measuring changes in forest carbon stock due to a reduction in deforestation rates requires significant infrastructure that was perhaps beyond the capacity of the 1997 agreement (Lyster, 2013). Methods for monitoring and measuring changes in carbon pools as a result of REDD+ initiatives remain a point of concern, and will be revisited later in the section.

Papua New Guinea and Costa Rica first brought up the issue of establishing a mechanism for reducing emissions from deforestation and forest degradation at the UNFCCC Conference of the Parties (COP) 11 in Montreal in 2005. In 2007, REDD was incorporated into the Bali Action Plan as a result of a $500 million annual commitment from Norway as well as overwhelming support from tropical nations with high rates of deforestation (ENB, 2007). The following year, at COP 14 in Poznań, the concept of REDD+ was introduced as an expanded version of REDD, including clauses protecting biodiversity conservation, sustainable forest management and carbon stocks enhancement (Yeang, 2012). In September 2008, the REDD Programme was officially launched under the umbrella of its three partner organizations: FAO, the United Nations Development Program (UNDP), and the United Nations Environmental Program (UNEP) (UN-REDD Programme 2014).

At COP 15 in Copenhagen in 2009, in order to "jump-start" clean energy growth in developing countries, UN Secretary-General Ban Ki-moon called for launching the

Copenhagen Green Climate Fund. It was decided that the Copenhagen Green Climate

Fund "shall be established as an operating entity of the financial mechanism of the

Convention to support projects, programs, policies and other activities in developing

countries related to mitigation including REDD+, adaptation, capacity building,

technology development and transfer" (UNFCCC 2010: 7).

Parties left the 2010 COP-16 meeting in Cancun having successfully created a

schedule for REDD+ participants. The 'Three Phases' are designed to build the necessary

capacities for REDD+ participants to effectively enforce policies designed to address

"conservation, sustainable management of forests and enhancement of forest carbon

stocks", as well as work to conserve biodiversity and protect indigenous tenure rights

(UN-REDD, 2010b).

> **Phase 1:** Development of national strategies or action plans, policies and
>
> measures, and capacity building (*i.e. identifying drivers of deforestation and*
>
> *forest degradation and barriers to REDD+, identification of REDD+ policies,*
>
> *institutional strengthening, pilot REDD+ demonstration activities and voluntary*
>
> *carbon market projects, etc.)*
>
> **Phase 2:** Implementation of national policies and measures and national
>
> strategies or action plans that could involve further capacity building,
>
> technology, development and transfer, and results-based demonstration
>
> activities (*i.e. land tenure and governance reforms, improving forest*
>
> *management techniques, developing sustainable agriculture, etc.)*

Phase 3: Results-based actions that should be fully measured, reported and verified. (UN-REDD Programme, 2010b)

Phase 1 is funded by donor-based grants. Phase 2 may be financed through donor-based grants, payments from funds (i.e. Green Climate Fund), and the sale of carbon credits on markets. Phase 3 may be financed through payments from funds and sale of carbon credits on markets (UN-REDD Programme, 2010a).

International support for REDD+ Readiness is currently being channeled through three separate modalities (UN-REDD Programme, 2010a):

1. **Bilateral agreements** between developed and developing countries, for both national-level Readiness activities (e.g. Government of Norway with Tanzania, Australian Government with Indonesia), and project-level demonstration (e.g. Australia and Germany with Indonesia).

2. **Forest Carbon Partnership Facility (FCPF).** The World Bank launched the FCPF at the Bali COP in 2007. It includes two funds: a Readiness Fund to support national-level REDD+ Readiness, and a Carbon Fund to purchase emissions reductions from participating countries. The Readiness Fund initially contained pledges of just over $100 million, and was designed to support only 20 countries. However, a total of 37 countries have now applied to join the FCPF and been accepted, although only the first 20 are currently eligible for support. The World Bank is therefore aiming to increase the size of the Readiness Fund to $185 million in order to meet current demand.

3. **UN REDD Programme.** In 2008, nine pilot countries became part of the UN REDD Programme (Bolivia, Democratic Republic of Congo, Indonesia, Panama, Papua New Guinea, Paraguay, Tanzania, Vietnam, and Zambia), which focuses exclusively on national REDD+ Readiness (Phase 1). Current pledges are around $107 million. Additional countries have applied to join and been accepted as observer status, the first of which were Cambodia and Ecuador.

As of November 2010, all pilot countries have already developed National Programmes and are beginning phase two – the implementation phase. As of 2015, none of the countries have moved onto phase three, where reduction of deforestation and forest degradation is measured, reported and verified, and then monetarily rewarded.

At the time of writing this thesis, December 2014 was the last the parties met to discuss climate change in Lima. Parties are yet to decide on a clear funding mechanism. Many support the idea of a market-based funding mechanism, but other countries are strongly opposed. President Evo Morales of Bolivia leads the opposition, taking issues with REDD's commodification of nature and sees the REDD Program as a tool developed nations use to evade their ultimate responsibility for climate change and shift burden of action to poorer nations (Morales, 2010). Partly for this reason, a set funding mechanism for REDD+ remains at a standstill – any private or public entity, or money from the Green Climate Fund, can be used as results-based REDD+ payments. It is still unclear how results-based payments will be distributed, as parties have not yet finalized methods for measuring, monitoring and verifying change in deforestation rates. COP 20

in Lima transferred the issues with REDD+ to the Subsidiary Body for Implementation (SBI) and Subsidiary Body for Scientific and Technological Advice (SBSTA). REDD+ will be revisited at this year's (2015) COP in Paris.

Supporters of REDD+ claim the program is a quick and highly cost-effective way to reduce carbon dioxide emissions—if REDD+ is successful, and deforestation rates are reduced by half by 2050, and these reductions are maintained thereafter, this would contribute up to twelve percent of the total emission reductions required to stabilize atmospheric CO_2 levels at 450 parts per million (ppm) through 2100 (Poffenberger et al., 2009: vi). In addition to providing measurable changes in atmospheric carbon levels, REDD+ can also assist in promoting accountable and transparent forest governance, secure and equitable forest tenure and sustainable livelihoods for poor and vulnerable rural communities (Poffenberger, 2009).

Criticisms for REDD+

On the surface, REDD+ appears to be an ideal solution to the tragic loss of tropical rainforest in developing countries. Developed countries are able to donate money towards forest conservation projects in developing countries, whereby the former can contribute to global atmospheric carbon reductions while the latter benefit on multiple levels, including environmental benefits gained at the local level from increased forest cover, in addition to obvious monetary benefits. However, many fear the goal of offsetting carbon emissions will overtake the other goals of REDD+ concerning biodiversity conservation and protection of indigenous peoples' rights.

Furthermore, some criticize the overly bureaucratic nature of REDD+, arguing it dilutes efficient market mechanisms with inefficient bureaucratic processes. Indeed, some take issue with REDD+'s overarching goal to "re-centralize" community forests by funneling carbon payments through national governments instead of directly assisting communities on the ground.

Biodiversity

If properly implemented, REDD+ has the ability to protect the ecosystem services provided by forests, including flood control, soil stability and biodiversity (Malhi and Marthews, 2013). Tropical rainforests are the most bio-diverse biomes on Earth, home to more than half the world's species (Malhi and Marthews, 2013). While measures for enhancing the multiple environmental benefits of REDD+ are included in the UN-REDD Programme Strategy (2010c) and the substantial international funding flows REDD+ is already generating what could be harnessed to support biodiversity conservation and protection of watershed functions (Agrawal et al, 2011), many are skeptical the UN-REDD Programme has the simultaneous capacity to enhance ecosystem services and reduce carbon emissions (Malhi and Marthews, 2013; Venter et al, 2009; Miles and Kapos, 2008; Burgman et al., 2007; Venter et al., 2006; Laurance et al., 2006; Malhi et al, 2008; Sodhi et al., 2004; Aragao and Shimabukuro, 2010; Putz and Redford, 2009; Stickler et al, 2009; Sasaki and Putz 2009; Bekessy et al., 2008; Brockerhoff et al., 2008; Barlow et al., 2007; Phelps et al., 2011).

First, REDD+ will likely focus on protecting high carbon-stock forests in regions where reducing carbon emissions will be most cost-effective (Venter et al, 2009; Miles and Kapos, 2008). The degree to which biodiversity and carbon priorities overlap will help determine the biodiversity benefits of REDD+. If REDD+ over-emphasizes protecting a forest's trees, which represent the bulk of its biomass carbon, without putting any focus on protecting species housed within the forests, biodiversity could be jeopardized. In the tropics, these species are often threatened by climate change (Malhi et al 2008), altered fire regimes (Sodhi et al 2004; Aragao and Shimabukuro 2010; Gardner et al 2010), and hunting (Gardner et al 2010). Thus, even if REDD+ were to act in the right places, if it fails to address the other threats to forest biodiversity, the result could be a minimal delivery of outcomes for conservation.

A number of studies have also warned of the danger that REDD+ could promote the expansion of monoculture plantations of nonnative species or "carbon farms," potentially at the expense of native forest (Putz and Redford, 2009; Stickler et al 2009; Sasaki and Putz 2009; Bekessy et al 2008). This would undoubtedly circumvent any potential biodiversity benefits and, in many cases, lead to biodiversity declines (Brockerhoff et al, 2008; Barlow et al 2007). A final issue is that REDD+ operates on a shorter timeframe than necessary for protecting biodiversity in the long-term, especially long-lived species (Phelps et al 2011). REDD+ currently does not have any set mechanisms for addressing potential biodiversity issues that could arise, as carbon payments are made only in cases of reducing the deforestation and forest degradation rate regardless of biodiversity conservation.

Tenure Security

The Food and Agriculture Organization (FAO) (2002) defines tenure security as "the certainty that a person's rights to land will be recognized by others and protected in cases of specific challenges" (18). Fundamentally, performance-based payments will require clear tenure rights, as demonstrated by payment for environmental services (PES) programs (Wunder, 2009). When tenure is unclear or not formalized, forest people may be excluded from forests and/or from participation in REDD+ benefits (Larson et al 2013). There is much evidence that strong tenure rights decrease risk of deforestation and forest degradation in community forests (Agrawal and Chattre 2008; Bluffstone et al 2013). The UN-REDD Programme Strategy commits to support the "full and effective engagement of Indigenous Peoples...at all stages of the process including design and implantation" (2010c). Individuals protecting a common-pool resource, such as a forest, have the UN-REDD Programme's commitment to support their "full and effective engagement...at all stages of the process" (2010); this will improve the capacity of local people to manage their resource with reference to principle three. The program strategy also plans assist national and international REDD+ processes to incorporate the rights and concerns of these key stakeholders into local REDD+ guidelines and strategies.

Despite these commitments towards protecting the rights of indigenous peoples, many fear REDD+ strategies could place tenure rights at risk in a number of ways (Corbera et al, 2011; Cotula and Mayers, 2009; Sikor et al., 1010, Gazoul et al., 2010;

Karsenty and Assembe, 2011). If forest tenure is currently insecure, unclear or in conflict, more powerful actors could gain rights to the land in the interest of obtaining REDD+ benefits. On state-owned lands, customary land users without formal rights could be subject to new rules and regulations, including restrictions on land use that lead to new hardships. If forest tenure is currently secure, unknowing or unscrupulous leaders could sign away rights and/or commit to obligations without fully understanding the consequences, or without obtaining the consent of those who live on the land. Potential tenure security problems expected to rise as a result of REDD+ implementation primarily address dealing with a secure relationship between local people and governmental authorities.

Corruption

Brown (2009) points out how measuring emission reductions on a project-by-project basis instead of measuring based on overall emissions may exacerbate problems of additionality, permanence, and leakage due to corruption. Tropical rainforests store 50 percent more carbon per unit area than forests elsewhere, and they are historically the site of some of the highest global rates of deforestation (Brown 2009). However, the countries with the highest rates of deforestation, and hence the prime candidates to supply credits in a REDD program, are among the world's most corrupt (Kishor and Damania 2007). Brown (2009) predicts rampant corruption will incentivize government officials to maximize funding from REDD+ through exaggerating actual amount of forest degradation and deforestation reductions, instead of increasing areas of reduction

through forest conservation policies. He predicts this will manifest in a number of ways; for example, double-counting areas where two projects overlap and bribing local forest officials to provide false information about forest area saved. Through an examination of its history, Brown concludes that the possibility and magnitude of corruption is especially high in the forestry sector due to the following reasons. First, it is difficult to accurately measure a baseline density for forest stocks in countries that lack infrastructure and funding. As such, baseline densities can be easily exaggerated. Second, forest agencies are typically understaffed and underfunded – salaries tend to be low enough to require forest agents to seek supplemental income (Gray 2002). Brown doesn't expect corruption to lessen in the future, as the huge global demand for wood products creates relentless pressure to harvest beyond these areas.

If REDD+ projects continue to be funded on a program-by-program basis instead of on a national level, some fear that while rates of deforestation will decrease in designated REDD+ areas, rates of deforestation in surrounding areas will increase (Brown 2009; Agrawal et al, 2011). However, even if emissions begin to be measured on a national level, the leakage into non-REDD+ countries is quite likely (Brown 2009). This will become especially apparent if REDD+ is successful. Assuming deforestation rates decrease and demand for timber remains high, prices for timber will only continue to rise. As such the opportunity cost of conserving forests will steadily increase for REDD+ participants as prices for timber rise, and rates of deforestation in non-REDD+ participants are also expected to rise (Brown 2009).

Decentralization of Forest Governance

The majority of tropical rainforests are controlled by national governments of developing countries (Bluffstone et al, 2013). However, due to a decentralization movement during the mid- to late 1980s transferring forest control from the central government to communities (Bluffstone et al, 2013), a rising percentage of tropical rainforests are defined as Community-Controlled Forests (CCFs). As of 2009, more than 25 percent of all tropical rainforests were community managed (World Bank), and local communities and organizations controlled an additional 200 million hectares in 2008 compared to the 1980s (Agrawal et al, 2008). CCFs can be considered a type of common property regime that is intermediate between private property, where rights and responsibilities are with individuals, households and firms, and state property where rights and responsibilities are vested in governments (Bluffstone et al., 2013). At its most extensive, decentralization allows stakeholders to redefine ownership, use, and management of forests (Phelps et al., 2010). Effective decentralization reforms have increased local actors' benefits and rights in forests, reduced costs of protection, and provided opportunities for biodiversity conservation (Phelps et al 2010).

In a study using original data across over 80 community forests in ten different countries by Chattre and Agrawal (2009), they found that larger forest size and greater rule-making autonomy at the local level were associated with high carbon storage and livelihood benefits. They argue that as "owners" of a piece of forest, community forest members feel more tied to the forest and are less likely to overuse forest products. Despite evidence that community forests provide greater carbon storage benefit,

central governments play a key role in the UN-REDD Programme, where governments own carbon stocks, orchestrate REDD+ processes, get carbon rents and choose to what extent and how to compensate villagers for lost access to forest resources (Bluffstone et al., 2013). The UN-REDD Programme requires detailed carbon-oriented forest management plants, reliable baseline data and subsequent quantitative MRV of emissions reductions at the national level, and resources for brokering deals between buyers and sellers (Phelps et al., 2010). Only a centralized government will be able to provide this information.

Alternatively, Bluffstone et al (2013) suggest market-based financing made directly by buyers of carbon credits (e.g. high income country polluters) to sellers (such as villagers in control of CCFs). If this were the case, flows could provide a stable, regular and long-term income source that may particularly benefit the poor, and would create an environment in which the benefits of conserving natural forest outweigh any potential benefits gained from extracting valuable timber from the forest, etc., which would strengthen a common-pool resource's management capacity under Basurto and Ostrom's principles (principle two). Market-based approaches are appealing since they appear to be more efficient and effective than project-based, state-led or regulatory conservation approaches, which are often perceived as cumbersome or ineffectual (Milne and Chervier, 2014). Payment for Environmental Services (PES) schemes, such as REDD+, were originally designed with the intention of assigning a market value to environmental services in order to reflect its true price. The economic rationale behind REDD+ is the idea that carbon payments would directly compensate local forest

managers for their work protecting and sustainably managing forestland, thereby

correcting for a market failure (Slunge et al, 2011). This would both benefit the buyer of

carbon credits as well as the sellers of healthy forestland; the former in their need to

offset greenhouse gas emissions and the latter in income gained from forest rents.

However, REDD+'s reliance on central governments and its position within the

bureaucracy within the United Nations have made the project anything but efficient

(Milne and Chervier, 2014).

Sustainably Managing Common-Pool Resources: Beyond the Tragedy of the Commons?

In 1968, Garrett Hardin presented his now famous theory of the "Tragedy of the

Commons," whereby pastoralists sharing a common pasture will undoubtedly continue

to increase their livestock until the pasture has been grazed beyond use. Hardin

illustrates that it is in the individual pastoralist's best interest to continue adding cattle

to his own herd; however, this strategy turns against the group of pastoralists in the

long run, when grazing becomes impossible due to overuse.

However, in the case of forestry in particular, community managed forestry

strategies are actually turning out to be quite successful. In their piece "Beyond the

Tragedy of the Commons", Basturo and Ostrom (2014) offer possible explanations for

this phenomenon. They suggest the difference lies in the level of trust and overall

quality of relationship between actors involved in sharing common pool resources. In an

experimental lab, eight subjects presented with a common-pool resource problem

overharvest when they do not know who is in their group, no feedback is provided on individual actions, and they cannot communicate (Ostrom et al 1992). Under such conditions, the common pool resource problem is amplified, just as Hardin predicts. When the same subjects are then enabled to sit face-to-face to discuss the issue, they are able to reduce overharvesting.

While community managed forests have been successful in many instances, they certainly have not been universally successful. Ostrom and Basturo identify eight attributes shared by long-enduring common-pool resource institutions (2014).

1. **Clearly Defined Boundaries** *Individuals or households with rights to withdraw resource units from the common-pool resource, and the boundaries of the common-pool resource itself, are clearly defined.*

2. **Congruence**

   a. *The distribution of benefits from appropriation rules is roughly proportionate to the costs imposed by provision rules.*

   b. *Appropriation rules restricting time, place, technology, and quantity of resource units are related to local conditions*

3. **Collective-Choice Arrangements** *Most individuals affected by operational rules can participate in modifying operational rules.*

4. **Monitoring Monitors,** *who actively audit common-pool resource conditions and user behavior, are accountable to the users or are the users themselves.*

5. **Sanctions Users** *who violate operational rules are likely to receive graduated sanctions (depending on the seriousness from context of the offense) from other users, from officials accountable to these users, or from both.*

6. **Conflict-Resolution Mechanisms Users** *and their officials have rapid access to low-cost, local arenas to resolve conflict among users or between users and officials.*

7. **Minimal Recognition of Rights to Organize** *The rights of users to devise their own institutions are not challenged by external governmental authorities.*

8. **Nested Enterprises Appropriation,** *provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.*[1]

Rather than applying the principles to a community, much like a blueprint to an empty plot, these principles seek to understand what elements or conditions contribute to particularly successful common-pool resource institutions. Indeed, the "design principles work to enhance participants' shared understanding of the structure of the resource and its users and of the benefits and costs involved in following a set of agreed-upon rules" (Basurto and Ostrom, 2014: 63). These principles will help contextualize our understanding of common-pool management in community forests in the REDD+ project area in Cambodia.

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[1] Specifically for common-pool resources that are parts of larger systems

REDD+ in Cambodia: Challenges and Successes

Economic uses of Forests in Cambodia

Cambodia is a small country in Southeast Asia, where more than 17.7 percent of the 15 million inhabitants live underneath the poverty line (The World Bank, 2012). It remains a mostly agricultural-based society, where 80 percent of the population lives in rural areas and 33 percent of land is used for agriculture. As promoted by the Council for the Development of Cambodia, Cambodia is "blessed with an abundance of fertile land natural resources, a trainable and inexpensive labor force, historical sites, tropical rainforests, national parks, rivers, lakes and pristine beaches," all of which are awaiting "investment and sustainable development" (2014). Indeed, the World Bank reports an average of 7.5 percent growth rate from 2005-2013, and GDP per capita has nearly doubled during that time.

In an attempt to rekindle its economy following a decades-long civil war, the Cambodian government turned to the country's extensive range of tropical rainforests in the 1990s. In the post-World War II era, the forest sector was viewed in many developing countries in Southeast Asia as an important component supporting early economic growth (Poffenberger, 2013a). From 1994-1997, the Royal Government of Cambodia (RGC) leased nearly 60 percent of its total rainforest cover to private logging companies in an attempt to boost its economy (Poffenberger, 2013a: 5). Indeed, the Cambodia Forest Policy Assessment conducted by the World Bank in the 1990s projected an income exceeding $100 million per year by instituting higher royalty rates on timber concessions and enforcing sustainable use practices (Poffenberger, 2013a:9).

However, the reality fell far short of expectations. In April 1996, a World Bank-funded

Forestry Policy Assessment report noted that Cambodia had experienced deforestation

of one million hectares and degradation of three million hectares of forests over the

past thirty years (1965-1995); this represented deterioration of about 35 percent of

Cambodia's forest ecosystem. Despite this huge sacrifice in natural capital, Cambodia's

actual annual forest revenues fell between $6 and $12 million from 1996 through 2001,

not even reaching 15 percent of original income projections (Poffenberger, 2013a:12).

In 2000, the Department of Forests and Wildlife (DF&W), currently reorganized as

the Forestry Administration, was under the scrutiny of foreign development agencies

and the mass media (Poffenberger, 2013a). In response to this international pressure,

the Cambodian government placed a moratorium on logging concessions in 2002

reversing the high rate of deforestation and forest degradation as a result of illegal

logging and unsustainable harvest (Dhiaulhaq et al., 2014). However, almost

immediately after the moratorium on logging concessions was passed, the government

began granting economic land concessions instead. By 2007, a Cambodian NGO

reported a total of 59 Economic Land Concessions had been granted to private

companies, representing more than 943,069 hectares of land (5.2 percent of total land

area; 14.5 of arable land) in rural Cambodia (Saracini et al, 2011). Most of this land

leased to private companies is then clear-cut in the interest of agro-industrial crops such

as rubber, sugar cane, cassava, palm oil, cashews, and acacia (LICADHO, 2015;

Poffenberger, 2013a). The Cambodian League for the Promotion and Defense of Human

Rights (LICADHO) estimated that by 2015 more than two million hectares from 272

concessions had been granted in the form of economic land concessions (LICADHO, 2015). Economic land concessions represent the most serious threat to community forests as they can only be controlled and regulated by national policy makers (Poffenberger and Smith-Hanssen, 2013).

Economic land concessions have been criticized from a human rights perspective for their failure to respect the resource rights and livelihood needs of resident people. A UN report written in 2007 concluded that:

> Economic land concessions have not led to increased agricultural productivity or economic growth in Cambodia, and large areas of conceded land have been left idle or underutilized (Supreme National Economic Council)

The acceleration in issuing economic land concessions has limited the capacity of the government and civil society to negotiate and assess legitimate community claims to forestlands. As a consequence, many areas that have traditionally been held as community forest use areas, as well as new areas with potential for community forest management are being allocated to the private sector, and often foreign-held firms (Poffenberger, 2013a).

Inequality of land distribution is one of Cambodia's most pressing challenges. Half of the entire rural population cumulatively owns less than 0.75 ha of land (RECOFTFC, 2014). While civil society and the Cambodian government have made considerable progress in formalizing community forestry groups, approximately ten to twenty times as much forest area has been allocated to economic land concessions when compared to the area allocated to community forestry groups (Poffenberger and Smith-Hanssen 2013: 39). Cambodia's five-year National Strategic Development Plan 2006-2010

acknowledges the need to improve the livelihoods of the rural poor as a top priority

(2006). The report noted that:

> Numerous studies of rural livelihoods paint a consistent picture of declining access
> to these resources; especially for the poor… part of it is due to a real decline in
> resource availability, as population increase and commercial interests have driven
> unsustainable overexploitation (ix-x).

Economic land concessions have resulted in problems of insecure land tenure and

rampant deforestation. Community-based forestry is a potential solution to this

problem; it has the potential to secure local peoples' rights to land and also decrease

deforestation by means of localized, sustainable forest management, in addition to

restoring watersheds and conserving biodiversity (Poffenberger, 2013a). Our next

section will outline the history, and current manifestation, of community forestry in

Cambodia.

History of Community Forestry in Cambodia

In the 1990s, increasing international pressure to shift from awarding logging

contracts to emphasizing forest restoration, conservation, and community benefits

caused the national Cambodian government to develop a national community forestry

strategic plan. This was designed with the goal to formally engage and reorganize the

rights of forest-dependent villages as partners in public resource management

(Poffenberger, 2013a). In 2002, the Forestry Administration began granting areas of

production forest for local management.

The Community Forestry Sub-decree of 2003 cemented community forestry into the

national policy landscape (RECOFTC, 2014). In order to become an official community

forest recognized by the Cambodian government, the community forest must obtain a Community Forestry Agreement with the Forestry Administration. Under this decree, community forestry members have the right to sustainably use forest resources within the granted area of a Community Forest Agreement, given communities abstain from selling or bartering within the first five years of approval (RGC, 2003: 11), and harvested products do not exceed the limit set under the terms and conditions of the Community Forestry Management Plan (RGC, 2003: 15).

A Community Forestry Agreement lasts for 15 years; one year prior to expiration, the Community Forestry Management Committee must submit a written request to renew the agreement for an additional 15-year term (RGC, 2003: 27). Even though a Community Forest Agreement allows a community to manage their forest independent of the government, the Royal Government of Cambodia still retains ultimate ownership of the forestland (Baird, 2014; Milne, 2013). If the community forest members and Community Forest Management Committee agree with a 2/3 majority to cancel the agreement, it may be cancelled. Additionally, the Royal Government of Cambodia can cancel the agreement under the condition of noncompliance or serious violation on part of the community forest members that results in non-sustainable use of forest resources, or if "there is another purpose which provides a higher social and public benefit to the Kingdom of Cambodia" (RGC, 2003: 10).

The Cambodian government approved the Implementation Guidelines (*Prakas)* for Community Forestry in 2006. This document describes the process for communities to identify, legalize and manage community forests (RECOFTC, 2014). This process was

further solidified in the 2010 National Forest Programme. The National Forest

Programme was designed to "sustain effective forest reform…aimed to place good

governance and effective partnerships at the center of sustainable forest management"

(RGC, 2010: 3). Cambodia's Millennium Development Goals help guide the structure of

the Forest Programme, in particular Cambodia's mission to attain 60 percent forest

cover by 2015. Community forestry became one of six key components of the Cambodia

National Forest Programme 2010-2029, because "local communities can mobilize

considerable human resources to protect forests if they feel adequately compensated

by the benefits from forest management" (RGC, 2010: 88).

The National Forest Program outlines a series of seven steps a community must

follow to be legally recognized under the Forestry Administration; these steps will be

summarized in the following paragraph. Before a community forest can be recognized as

such, at least 60 percent of village households must agree to join the community forest;

then local authorities (village chief, commune chief, and governor of district) must

submit a written request to the provincial or city governor (RGC, 2006). After receiving

approval from the provincial governor, the community must elect a Community Forest

Management Committee (CFMC); after the CFMC is established, the CFMC will send a

formal request to the Forestry Administration in order to be legally recognized as a

community forest (RGC, 2010). The CFMC is responsible for preparing and adopting

community forestry by-laws with involvement from community forestry members (RGC,

2006). After the by-laws have been distributed to Community Forestry members, the

boundary of the Community Forest is demarcated using GPS, with the assistance of the

Forestry Administration or Non-Governmental Organizations (NGOs) (RGC, 2010). Finally, a Community Forestry Agreement outlining the roles and responsibilities of the CFMC is prepared by the Forestry Administration, and signed by the CFMC and the Forestry Administration (RGC, 2010).

As of 2012, 451 Community Forests were under development, covering a total area of 397,745 hectares, or approximately four percent of Cambodia's forest area (RECOFTC, 2014: 10). The Forestry Administration hopes to transfer two million hectares of state public forests (or about 20 percent of the nation's forests) to communities over the next decade (RECOFTC, 2014).

REDD+ in Cambodia

Based on the FAO 2005 Forest Resources Assessment, Cambodia is the 13th most forested country by percentage of land area. Cambodia's National Programme Document for the UN-REDD Programme (2010b) reports a relatively high rate of land-use change in Cambodia with Forestry Administration statistics showing that 379,485 hectares of forest were lost between 2002 and 2006, a deforestation rate of 0.8 percent per year. As a consequence, Cambodia has been classified as a 'high forest cover, high deforestation' country for the purposes of REDD+. Cambodia's first REDD+ pilot program in Oddar Meanchey was approved in May 2008. Shortly thereafter, the Seima Protected Forest was also approved in 2009. In addition to these two REDD+ pilot programs, there are also five REDD+ demonstration projects in other provinces across the country, totaling more than 1.2 million hectares (Yeang and Brewster, 2012: 266). The project is expected to sequester 7.1 million tons of CO_2 over the next thirty years (Poffenberger

2013b: 64). It hopes to do so by simultaneously mitigating the impact of identified drivers of deforestation and forest degradation and responding to the economic needs of the low-income rural populations that inhabit the project area.

Prime Minister Hun Sen officially endorsed the project in May 2008 by signing the Council of Ministers circular No. 699, which designates the Forestry Administration as the agent of the Royal Government of Cambodia to arrange for the sale of forest carbon credits from the Oddar Meanchey REDD+ pilot project (UN-REDD, 2010b). The guiding principles ensure that carbon revenues are used to (1) improve forest quality, (2) provide maximum benefits to local communities that participate in project activities, and (3) identify new REDD projects in Cambodia (IGES, 2013). In contrast to implementing uniform REDD+ policies across all REDD+ participant countries, REDD+ strives to "support implementation of existing policies and strategies for management of forest resources" and to assign functions to existing government ministries instead of "creating new institutions in an already crowded and complex institutional environment" (UN-REDD Programme, 2010b: 20). Through use of the "nested approach", REDD+ will be implemented in Cambodia by linking subnational action to a national framework.

In addition to preparing the Cambodian government to implement and enforce policies, the REDD+ Readiness Roadmap for Cambodia, created in 2010 through the efforts of the Cambodian government and the UN-REDD Program, clearly identifies the drivers of forest degradation and deforestation and provides an implementation framework for REDD+ strategies.

Initial payments have already been made to help Cambodia develop its capacity to adopt the REDD program into its existing national government, create the necessary policies, and assess baseline conditions in the country. After baselines are set, there are plans to link Cambodia to the voluntary carbon market. Baseline conditions are predicted using a land use change model, which takes into account forest cover both in project areas as well as potential leakage areas (UN-REDD, 2010b). The reduction of deforestation under the project scenario is forecasted by modeling the effect of each project activity on a complex set of deforestation agents and drivers (Poffenberger, 2009). In addition to efforts made to reduce the rate of deforestation, there are also initiatives designed to increase carbon stock within the forest, such as removing invasive species to let native species regenerate, and enrichment planting (UN-REDD Programme, 2010a).

The Cambodian government agreed to test REDD+ in order to see the extent to which results-based carbon payments can be used as a mechanism for generating state revenue (Milne and Chervier, 2014). These carbon payments would be collected as an alternative to leasing forestland to companies as economic land concessions. As the majority of deforestation can be attributed to companies granted economic land concessions, the ability of carbon payments to compete with money gained from companies is crucial to REDD's success. The Cambodian government's attitude towards REDD+ is strictly financial; as stated in the 2010 National Forest Program document states: "Conservation of healthy forests will attract state revenue through payments for environmental services" (RCG 2010: 11). Furthermore, REDD+ revenues will first be

channeled through the Ministry of Economics and Finance before it reaches the Forest Administration, and then finally distributed to local stakeholders (Milne and Chervier, 2014:13). It is expected that only about 50 percent of REDD+ profit will actually go to communities (Milne and Chervier, 2014: 13; Yeang, 2012).

Case Study: Oddar Meanchey

Background

Oddar Meanchey is a province in northwestern Cambodia on the border of Thailand. After decades of political insecurity, peace finally came to Oddar Meanchey in the late 1990s. Shortly thereafter, rumors of Oddar Meanchey's great expanse of thick

Figure 1. Map of Cambodia (Bradley, 2009)

forestland drew a heavy influx of migrants with hopes of claiming some forestland for agricultural purposes. From 1990-2000, the province's population grew at a remarkable twelve percent, while forests disappeared at more than two percent annually (Poffenberger, 2013b:63). Despite this, primary forest still covers 68.8 percent of Oddar Meanchey (Yeang 2012). The combination of a high deforestation rate and a large amount of primary forest cover is what makes Oddar Meanchey especially appealing for the REDD Programme (TGC, 2012; Yeang and Brewster, 2012; Poffenberger, 2013b).
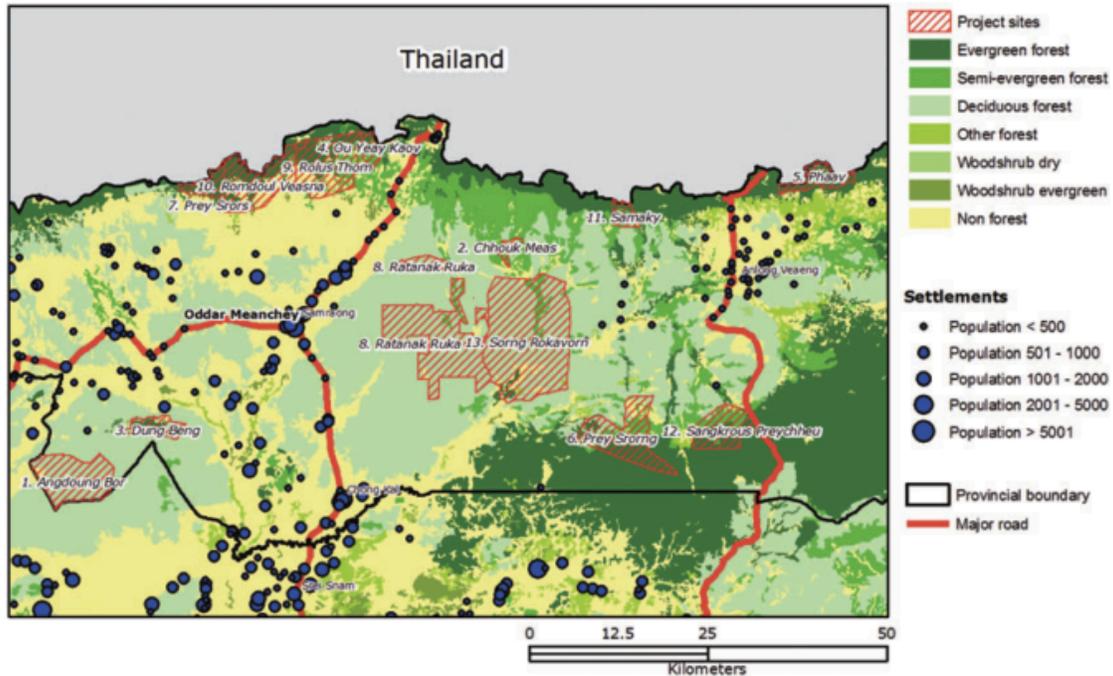
Figure 2. Community Forests in Oddar Meanchey (Poffenberger, 2009b)

The 13 community forests that compose the REDD+ pilot program in Oddar

Meanchey cover a total of 63,831 ha. with forested area (the area included in REDD+)

accounting for 56,050 ha (UN-REDD Programme, 2010a). In order to understand how

effectively the REDD+ project will achieve its goals both in terms of carbon

sequestration as well as improving local livelihoods and conserving biodiversity, it is

important to first understand how existing community forests have fared preserving

their forest without heavy bureaucratic support. The following section will examine the

resource management strength of existing community forests in Oddar Meanchey using

select principles from Basurto and Ostrom's (2014) "Design principles illustrated by

long-enduring common pool resource institutions" (62).

The Monk's Forest

At 18,164 hectares, Song Rukavorn Community Forest, colloquially referred to as the Monk's Forest, is the largest and, by all accounts, most successful community forest in the project (Poffenberger, 2013b; Thuon, 2013; Yeang, 2012; Bradley, 2012). Much of its success can be attributed to the Venerable Bun Saluth, the monk of the Monk's Forest. After spending some years studying Buddhism in Thailand, Bun Saluth returned to Cambodia inspired by the environmental movement in Thailand to protect Cambodia's natural resources. In 2002, he received permission from the government of Cambodia to set aside an area just under 20,000 hectares as a "protected forest and animal conservation" (UNDP, 2012). From 2002 to 2006, Bun Saluth led other monks in the monastery to patrol the forest and reprimand trespassers; villagers who traditionally used forestland to help sustain their livelihoods were no longer allowed to access the now protected forest and animal conservation. Villagers felt excluded from resources they felt were rightfully theirs; they spread rumors that the monk had established this protected area as such in order to selfishly keep forest resources for himself. Villagers lacked respect for both the monk and the forest and continued to stealthily fell trees and encroach on forestland (Personal Interview, Community Forest Member, 5 August 2013). To combat this, the Venerable Bun Saluth put up signs stating "Protected Area: Do Not Enter," but this proved to be largely ineffective – the signs would break or villagers would physically move the signs deeper into the forest in order to expand agricultural land (Personal Interview, Bun Saluth, 1 August 2013). Without the

infrastructure to effectively restrict public access to the forest, and without local buy-in to forest conservation, the monk struggled to defend the protected area against trespassers.

In 2008, the protected forest and animal conservation became legally recognized under the Forestry Administration as the Rukavorn Community Forest (Poffenberger et al., 2009; Pasgaard and Chea, 2013). Thereafter, community forest members had legal right to obtain Non-Timber Forest Products (NTFPs) from the forest, and were encouraged, rather than forbidden, to use the forest. Ostrom and Basurto's eight principles will guide us through an analysis of the Monk's Forest in the following section in an attempt to understand reasons behind its success.

Principle One: Clearly Defined Boundaries

The first part of these principles emphasizes the importance that individuals or households with rights to withdraw resources are clearly defined, in contrast to individuals or households who lack these rights. After the community forest was officially established, the monks in the local monastery spread understanding of forest value and conservation to villagers (Personal Interview, Bun Saluth, August 2013). In interviews with community forest members, it was clear they understood their duty to protect the forest; when asked why they protect the forest, most mentioned some variation of keeping the forest thick and full of life for future generations. Indeed, community forest members consistently compared themselves to non-community forest members and emphasized the importance of both preventing the latter from

misusing the community forest and the advantages they had as a result of the forest. I would argue that the clear distinction between "community forest member", who have the right to withdraw resources from their forest, versus "non-community forest member" helped embolden the former's resolve to protect *their* forest.

The second part of the principle addresses clearly defined boundaries around the common-pool resource itself. In order for a community forest to receive official recognition from the Cambodian government, the boundaries of the community forest need to be demarcated using Global Positioning System (GPS) (with the assistance of the Forestry Administration or NGOs) (RGC, 2010). After the community forest was officially established, the monk mounted posts and signs around the perimeter of the forest in order to clearly mark the edge of the community forest. Despite these efforts, outside villagers would continue enter the forest to illegally harvest timber or hunt endangered species (Personal Interview, Bun Saluth, August 2013). In the years prior to 2013, the monk began digging a trench around the complete perimeter of the forest; as of 2013, he has completed the trench around two sides. Trenches are much more ecologically inclusive than fences, as native fauna can easily cross; furthermore, illegally harvested logs are almost exclusively transported by tractor or truck – transportation vehicles are unable to cross the trench without refilling it (Pact Cambodia, 2013). Since building the trench, he has not noticed any agricultural encroachment.

The second principle states that the benefits of protecting a community forest outweigh the costs. In the Monk's Forest, community forest members are able to supplement their income by collecting Non-Timber Forest Products (NTFP) from the forest (i.e. resin, sap, mushrooms, rattan, bamboo shoots, traditional medicine etc.) in exchange for watching over the forest, or, in the case of community forest management committee members, going on active patrols. Community forest members interviewed agreed unanimously that benefits gained from having a forest far outweighed costs imposed (i.e. forbidden from cutting valuable timber for sale on the black market), as the alternative seems to be having no forest at all. The reality of the alternative is far too real, as private companies have already converted much of the forest in the surrounding areas to large-scale plantations.

An interview with a non-community forest member villager, whose village is in close proximity to the Monk's Forest, illuminated the social impacts of economic land concessions. Most people who live in his village have either left to work in factories in Thailand or are working for hire at a cassava plantation that used to be village land.

> "If they [community forest members] have a shortage of something, there's a community forest they can go into and use. If they ever don't have enough it's because of their own lack of ability. In other places, it doesn't matter how hard you work or try – you still won't have enough" (Interview with villager in non-community forest, 2013).

In contrast to the villager outside the community, a community member passionately explained that,

If we didn't have a forest, there'd be no more Cambodia! If we didn't have this forest, we wouldn't have anything! If you wanted to get resin, you couldn't! If you wanted to dig up bamboo shoots, you couldn't! Everything would be harder! (Personal Interview, 2013)

A study by Pasgaard and Chea (2013) found that land grabbing disproportionately affects poorest members of households. The poorest members of recently developed villages in Oddar Meanchey tend to be poor and landless migrants who abandon their home provinces in the hope of getting agricultural land. While original villagers clear-cut the forest for agriculture, the late arrivals have no choice but to buy land from other villagers. This purchased land tends to be further off the main road; as it happens, economic land concessions also tend to be planned and realized a certain distance away from the main road. Indeed, several community forest members interviewed mentioned they once had land at the location of the current cassava plantation; now all they have is the bit of land attached to their house and the NTFPs they collect from the forest.

Principle Three: Collective-Choice Arrangements

The third principle states that individuals affected by community forest laws are able to participate in modifying these laws. Part of the condition of establishing a legally recognized community forest is electing a Community Forest Management Committee and collectively creating and distributing community forest laws. If after initial standards for the forest have been established, community forest members take issue with management strategies they may bring their suggestions to their local community forest

management committee member, or directly to the monk (Personal Interview, Bun

Saluth, August 2013).

Principle Four: Monitoring

This principle both notes that community forest management committee members

(i.e. people who conduct patrols) must be actively involved in auditing common-pool

resource conditions, and must also be either accountable to users (i.e. community forest

members) or users themselves. Community Forest Management Committee (CFMC)

members patrol the forest daily; they ride either a bike or a motor scooter to the

forest's edge, and continue into the forest on foot. One committee member reported he

patrolled six to twenty hours per day, depending on the season (the hot season

warrants more patrols because of fire issues) (Personal Interview, CFMC member,

August 2013). In addition to assuring everyone is abiding by community forest law,

committee members use the time spent patrolling to collect resin, sap, mushrooms,

bamboo shoots, and other NTFPs to sell on the market (Personal Interview, CFMC

member, August 2013). One particularly enthusiastic CFMC member had all of his

agricultural land taken by an economic land concession; the only land he has left is the

land that extends from his house – "If there were no forest, there would be no value in

living here. There would be nothing to help us live here" (Personal Interview, CFMC

member, August 2013).

Community forest members unanimously agreed they didn't dare to enter the forest

to cut down trees because "they'll catch you". This 'they' refers to both the committee

members as well as the monk himself, who also enters the forest at least once per day.

In contrast to the committee members who conduct 'active' patrols, community forest members conduct 'passive' patrols; all community forest members also said they would call either the committee members or the monk himself in case they saw anyone misusing the forest (Personal Interview, Community Forest Member, August 2013).

Principle Five: Sanctions

Long-enduring common-pool resource institutions tend to implement laws whereby users who violate operational rules receive graduated sanctions from other users or from officials accountable to these users. The Venerable Bun Saluth emphasizes the importance of education, understanding, and forgiveness. As such, first-time offenders are treated as "disobedient children" (Personal Interview, Bun Saluth, August 2013). In such a case, the monk would ask the offender: "Did you know you weren't allowed to cut down trees from the forest? Do you know why we have these rules? Do you want the forest to go to the companies? Or do you want to keep the forest for us to use?" The monk then explains how the availability of NTFPs is a privilege; community forest members are lucky to be able to extract monetary from the forest. Before the offenders can continue on their way, they must first sign a document with their fingerprint that promises they will not misuse forest resources again. The monk asserts this method has been highly effective in reducing illegal timber harvesting by villagers in the area (village heads, soldiers, etc. continued to violate community forest laws until more severe measures were taken). Indeed, in interviews with community forest

members across several villages, all members unanimously agree they are too afraid of being caught by the monk or committee members to risk cutting down trees.

In cases of more serious crimes, where the violator is a repeat offender or is in a position of authority within the community forest (i.e. committee member, village chief, etc.), the monk will bring offenders to the local police, the Forestry Administration, or the military. These government entities then levy graduated fines against offenders; in more serious cases violators have been sentenced to jail time.

Principles Six and Seven: Conflict-Resolution Mechanisms and Minimal Recognition of Rights to Organize

In order for community forest members to have access to arenas to resolve conflict among users or between users and officials, it is also crucial that governmental authorities accept community forest laws and boundaries. Therefore, principles six and seven work in tandem to explain the successes of the Monk's Forest in this regard. With more serious offenses, Bun Saluth will escort offenders to local police, the local Forest Administration office, or the military, who will in turn levy fines. Additionally, the soldiers occasionally accompany the monk and committee members into the forest in order to immediately levy small fines against violators (usually for poaching cases); in exchange, the monk fills the gas tanks of the soldiers' motor scooters (Personal Interview, Bun Saluth, August 2013). Cooperation between the state and the community forest is essential to the success of the Monk's Forest, though the friendly relations between the Monk's Forest and local officials had not been immediate. When the

community forest was first implemented, local officials firmly opposed the community forest and the monk, mostly because these officials could profit so much from illegal logging. The monk asserts this attitude finally changed after a village head was caught for illegal logging, and went to prison for five years in addition to paying a substantial fine. Bun Saluth clearly understood that punishing violators of community forest law was well within his rights; as such, he was eventually able to command respect from local officials.

Presently, there exist very few conflicts among users or between users and officials. However, there still exists a certain amount of conflict between community forest members and outside villagers. All community forest members interviewed explained that if they saw anyone else cutting down the forest, they will "call the monk." Conflict is generally dealt with in this way – the monk will address any issues with forest violation, and if he encounters something more severe he will refer violators to the authorities (Personal Interview, Community Forest Member, August 2013).

In Sum

The Monk's Forest has already independently become a self-sufficient, highly functional example of a community forest. At the local level, the addition of carbon payments will only strengthen this by offering local stakeholders a small income for patrolling the forest. As the Monk's Forest has already been quite successful without carbon payments, carbon payments will have a greater effect at the national level. While the Monk's Community forest is currently protected under national law, the

Cambodian government has the right to terminate a community forestry agreement "if there is another purpose which provides a higher social and public benefit to the Kingdom of Cambodia". This final clause of the Community Forestry Agreement guidelines leaves much room for interpretation; the establishment of military barracks or granting community forest area as economic land concessions may fit the qualifications for a "high social and public benefit". REDD+ payments add an extra layer of protection to the Monk's Forest, especially in a case where carbon payments could provide a higher economic benefit to the Cambodian government than an economic land concession.

Community Forests in Oddar Meanchey: A Failed Mechanism

Community forestry was created with the idea that community forest members would work to reduce deforestation out of their own self-interest. Despite gaining legal recognition as community forests in 2008 (2011 in the case of Rolus Thom) (Yeang, 2012), eleven of the 13 community forests that cover 68.4 percent of the total surface area (Yeang and Brewster, 2012: 270) of the pilot REDD Programme in Oddar Meanchey have been largely unsuccessful to date (Seangly, 2013; Lang, 2014). While it may be unrealistic to expect local management to tackle economic land concessions, the biggest driver of deforestation in the area (Poffenberger and Smith-Hanssen, 2013), the Cambodian National Forestry Program outlines that through establishment of a Community Forest Management Committee (CFMC) local drivers of deforestation can

be minimized (RGC, 2010). The failure of these eleven community forests to reduce

even local causes of deforestation suggest other factors that may tie into successful

common-pool resource management. The following section will analyze themes

observed across the eleven less successful community forests in Oddar Meanchey in

light of Basurto and Ostrom's Eight Principles.

Principle One: Clearly Defined Boundaries

The first part of this principle touches on the idea that individuals or households

need the right to withdraw resource units from the common-pool resource. All

community forest members are legally permitted to collect Non-Timber Forest Products

(NTFP) from the community forest, and can even ask for permission from the

community forest chief to cut down a tree (under select circumstances). However, in

five different community forests, community forest members reported that military

presence has hindered their ability to collect NTFPs from the forest, as soldiers (illegally)

require that community forest committee members ask permission before entering the

forest.

The second part of this principle states that the boundary of the common-pool

resource itself must be clearly defined. After each community forest was established,

Pact Cambodia, a Cambodian NGO, supported boundary sign and post installation in all

of the community forests. Each forest received around 100 boundary posts to

demarcate their boundaries (Pact Cambodia, 2013). Despite this support, all eleven

community forests report that unclear boundary demarcation of the community forest

area has resulted in continued deforestation within community forest boundaries, as the 100 boundary initial posts have since been lost or illegally removed (Thuon 2013). Terrra Global Capital (TGC) reported that land clearing for agriculture represents the highest cause of deforestation at the local level (2013); indeed, Community Forest Management Committee (CFMC) members across all eleven community forests reported that local villagers continue to expand agricultural land into the community forest (Thuon 2013). Land speculation, where a piece of forestland is felled then resold, also continues to be a problem (Poffenberger, 2013b); one CFMC member from the Ou Yeay Kaov community forest reported that non-community forest members from nearby villages claimed several parcels of community forest area to sell (Thuon 2013). The community forest chief in Ou Yeay Kaov estimated that around 200-300 hectares of forestland were claimed illegally and sold to approximately 52 migrant families.

Principle Two: Congruence

Under the second principle, common-pool resources may only be successfully managed in the long-term if the benefits gained from the resource outweigh (or are proportionate to) the costs to protect it. Chhouk Meas, for example, is the smallest community forest at only 383 hectares (Terra Global Capital, 2012: 8). Chhouk Meas community forest members are unable to make a living from forest resources, nor are their agricultural yields sufficient to sustain their livelihoods. As a result, the majority of community forest members seasonally migrate to Thailand to supplement their income. Not only does this speak to the quality of the forest itself in terms of available NTFPs,

but also to each individual community forest member's commitment to the forest. In abandoning their homes for a season to make money in Thailand, they are also leaving the forest unpatrolled, and therefore vulnerable, as forest patrol was reported to be the most effective method of combatting forest resource abuse (Thuon 2013). In this case, the costs of maintaining the forest (i.e. time spent patrolling, opportunity cost of staying in Cambodia vs. working in Thailand) are far higher than benefits gained.

Principle Three: Collective-Choice Arrangements

Part of the condition of establishing a legally recognized community forest is electing a Community Forest Management Committee and collectively creating and distributing community forest laws. In the case where a community member or committee member are disgruntled with the mode of operation, there lack effective mechanisms for an individual to modify operational rules. Instead, most decisions are made at the local administrative level without much input from community forest members (Thuon 2013).

Principle Four: Monitoring

The first part of the fourth principle concerns the active participation of common-pool resource monitors. The second part of the principle emphasizes that community forest monitors must be either accountable to the users or be the users themselves. In the case of Chhouk Meas, as outlined above, CFMC members, as well as community forest members, seasonally work abroad in Thailand to supplement their income, leaving the forest unwatched. While there are no reports of community forest

members misusing the forest, community forest members recounted that they lack the ability to prevent non-community forest members from trespassing into community forestland and misusing forest resources, and that they lack the capacity to hold non-community forest members accountable under the same code of law as those within the community (Thuon 2013). Indeed, forest patrolling was reported as the most effective form of protecting forest resources; under the first part of the second principle, it stands to reason that the inactive participation of CFMC members, as well as community forest members – both in terms of dependence on the forest (i.e. active users of the forest as per principle four) and in terms of time spent patrolling (i.e. active participation as per principle four)—contributes to the inability to effectively prevent outsiders from violating community forest law.

Principles Five, Six and Seven: Sanctions, Conflict-Resolution Mechanisms, and Minimal Recognition of Rights to Organize

This paper draws together these three principles in this section because the ability of a community forest group to successfully resolve conflict requires local authorities that respect community forest laws and boundaries, and areas that successfully implement sanctions do so through local authorities (i.e. military, police, forestry administration). Five of thirteen total community forests reported that military presence interfered with their ability to effectively manage forest resources; two out of thirteen reported that local authorities fail to recognize community forest law.

In 2012, the Royal Government of Cambodia ordered that two military camps be built within protected community forest area in Angdoung Bor and Dung Beng on orders from the Royal Government of Cambodia in order to secure Cambodia's northwestern border against Thailand (Naren, 2013; Lang, 2014b, Naren and Peter, 2014). Installing these military camps resulted in the loss of 900 hectares and 360 hectares in Angdoung Bor and Dung Beng, respectively (Thuon, 2013:40; Lang, 2014b). In addition to physical forestland loss from military encroachment, community forest members also reported loss in their ability to extract forest resources and conduct patrols. In the aforementioned community forests, soldiers no longer permit community members to manage and use their own forest. Furthermore, committee members must ask permission from the military before conducting patrols and the military forbids committee members from patrolling select areas (allegedly areas where the military is involved in illegal timber extraction) (Thuon 2013). As a result, committee members conduct fewer and fewer patrols, and community and non-community members alike expand agricultural land into the forest unchecked – committee members estimate a total of 800 ha of forestland have been cleared as a consequence. Furthermore, the military is engaged in the illegal sale of community forestland.

As community forest members and local governmental authorities fail to cooperate, there exists minimal infrastructure through which committee members can resolve conflicts between users, users and authorities, or users and outsiders. Committee members report feeling powerless against the military; even though they "see the destruction, they can't take action against it" (Seangly 2013b). All committee

members areas that reported military encroachment, also reported a decrease in participation in the community forest.

Two of the thirteen community forests reported that local authorities (i.e. village chief, police, etc.) failed to respect community forest laws and boundaries. For example, in Roulous Thom, village chiefs refuse to recognize community forest areas and the authority of the community forest management committee; local authorities in both Roulous Thom and Chhouk Meas regularly sell community forestland to migrants and fail to inform outsiders about community forest boundaries, laws, etc. (Thuon 2013). As a result, many outsiders consistently misuse community forest resources (Thuon 2013). If committee members do catch forest misusers on a patrol, the most they can do is confiscate any illegal items (i.e. chainsaws); there is currently no clear mechanisms to sanction forest violators. This has resulted in unchecked exploitation of community forestland and resources.

In Sum

Even with just 50 percent of REDD+ profit going to the communities, the financial support provided by REDD+ could have very positive outcomes at the community forest level. REDD+ payments can be used to establish less permeable borders around the community forests, perhaps using the Monk's Forest's trench strategy as an example (principle one). REDD+ payments could also offer a small salary to forest patrollers, which will make the benefits of protecting the forest equal to or greater than the costs of patrolling, especially in areas where the forestland itself does not offer enough

resources to sustain the local people (principle two). Additionally, REDD+ payments may result in increased support from local authorities, including local police, military, and village officials. If the lower levels of government are due to receive REDD+ payments, they may find it more profitable to join forces with the community forests, rather than illegally harvesting timber and selling community forest land. With support from the local administration, the community forests will be able to administer graduated sanctions on violators, as they will be able to effectively manage their forest without interference from, indeed, working with, external government authorities (principles five and seven). The external nature of REDD+ may also provide the forum necessary to resolve conflict among users or between users and officials.

Conclusion

Many critics believe the bureaucratic structure of REDD+ is not conducive to reducing rates of deforestation in locally-managed areas; indeed, some say (Bluffstone et al., 2010; Agrawal et al., 2008) the overly centralized mechanisms of REDD+ may destroy the decentralization reforms that have occurred over the past several decades, increasing local actors' benefits and rights in forests, reduced costs of protection, and provided opportunities for biodiversity conservation (Phelps et al., 2010). This paper demonstrates that government buy-in, on both local and national levels, is critical for REDD+ to be successful. Failure of local governmental authorities to recognize the laws and boundaries of community forests greatly impacted the ability of community forest members to implement community forest law, as per principle seven. In this case, carbon payments could incentivize local authorities to become more active in forest conservation to the point where benefits of conserving the forest outweigh the costs (i.e. opportunity cost of illegally harvesting timber), especially in cases where local officials would not benefit from legally obtained resources (i.e. NTFPs) otherwise, as per principle two.

Some critics doubt REDD+'s ability to simultaneously increase forest carbon stocks, protect Indigenous Peoples' rights and conserve biodiversity. Indeed, REDD+ offers no clear mechanism for approaching either of these issues. However, as evidenced from the case study in Cambodia and in line with design principle seven, cooperation between local stakeholders and governmental officials enables community forest members to enforce community forest law without fear of interference from

external government authorities. As such, assuming carbon payments incentivize government officials to support community forest initiatives, the inherent properties REDD+ will likely strengthen local tenure security. Critics for biodiversity express concern that REDD+ will favor high-carbon stock forests over high-biodiversity forests. This paper does not speak to how future REDD+ programs will be chosen. However, REDD+ program locations thus far have been chosen if they are characterized as 'high forest cover, high deforestation rate' areas, without additional consideration for carbon stocks (UN-REDD, 2010).

In the case of the Monk's Forest, local management has proved quite effective at reducing local drivers of deforestation (illegal logging, migrant land clearing, etc.). If administered correctly, REDD+ would provide the mechanisms necessary to provide funds at the local level to empower community forest members and their committees to combat local drivers of deforestation. Moreover, carbon payments could influence land conversion rates on a national level, whereby carbon payments gained from conserving forests are higher than potential profits gained from economic land concessions.

If REDD+ is successful at reducing deforestation rates, basic laws of supply and demand dictate that a constricted supply results in a price increase. As a result, economic land concessions will become more profitable. If REDD+ is to truly hopes to be successful in the long-term, carbon prices will need to be competitive enough to make conserving forestland the more financially sound choice.

Works Cited

Aalde, H. (Norway), Gonzalez, P. (USA), Gytarsky, M. (Russian F., Krug, T. (Brazil), Kurz, W. A. (Canada), Ogle, S. (USA), … Somogyi, Z. (European C. (2006). Agriculture, Forestry and Other Land Use. In *IPCC Guidelines for National Greenhouse Gas Inventories: Agriculture, Foresty and Other Land Use*.

Agrawal, A., Nepstad, D., & Chhatre, A. (2011). Reducing Emissions from Deforestation and Forest Degradation. *Annual Review of Environment and Resources*, *36*(1), 373–396. doi:10.1146/annurev-environ-042009-094508

Angelsen, A., Brockhause, M., Sunderlin, W., & Verchot, L. (Eds.). (2012). *Analyzing REDD+ Challenges and Choices*.

Aragão, L. E. O. C., & Shimabukuro, Y. E. (2010). The incidence of fire in Amazonian forests with implications for REDD. *Science (New York, N.Y.)*, *328*(5983), 1275–1278. doi:10.1126/science.1186925

Baird, I. G. (2014). Reduced Emissions from Deforestation and Forest Degradation (REDD) and Access and Exclusion: Obstacles and Opportunities in Cambodia and Laos. *Southeast Asian Studies*, *3*(3), 643–668.

Bane, J., Nune, S., Mekonnen, A., & Bluffstone, R. (Eds.). (2007). Policies to Increase Forest Cover in Ethiopia. In *Environmental Economics Forum for Ethiopia*. Addis Ababa, Ethiopia: Ethiopian Development Research Institute.

Barr, C. M., & Sayer, J. a. (2012). The political economy of reforestation and forest restoration in Asia-Pacific: Critical issues for REDD+. *Biological Conservation*, *154*, 9–19. doi:10.1016/j.biocon.2012.03.020

Basurto, X., & Ostrom, E. (2014). Beyond the Tragedy of the Commons. In K. Conca & G. D. Dabelko (Eds.), *Green Planet Blues: Critical Perspective on Global Environmental Politics* (5th ed., pp. 53–64). Westview Press.

Bluffstone, R., Robinson, E., & Guthiga, P. (2013). REDD+and community-controlled forests in low-income countries: Any hope for a linkage? *Ecological Economics*, *87*, 43–52. doi:10.1016/j.ecolecon.2012.12.004

Bottazzi, P., Cattaneo, A., Rocha, D. C., & Rist, S. (2013). Assessing sustainable forest management under REDD+: A community-based labour perspective. *Ecological Economics*, *93*, 94–103. doi:10.1016/j.ecolecon.2013.05.003

Bradley, A. (2009). *Communities and Carbon: Establishing a Community Forestry-REDD Project in Cambodia*. Phnom Penh.

Bradley, A. (2012a). Briefing Paper : Legal Aspects of Entering the Voluntary Carbon Market Lessons Learned for Cambodia. *Pact Cambodia*, 1–13.

Bradley, A. (2012b). Does Communty Forestry Provide a Suitable Platform for REDD? In L. Naughton-Treves & C. Day (Eds.), *Lessons about Land Tenure, Forest Governance and REDD+: Case Studies from Africa, Asia and Latin America* (pp. 61–72).

Brockhaus, M., Gregorio, M. Di, & Carmenta, R. (2014). REDD + policy networks : exploring actors and power structures in an. *Brockhaus, M., Gregorio, M. Di, & Carmenta, R. (2014). REDD + Policy Networks : Exploring Actors and Power Structures in An. Ecology and Society, 19(4).Ecology and Society*, *19*(4).

Brown, M. (2009). Limiting Corrupt Incentives in a Global REDD Regime. *Ecology Law Quarterly*, *37*(237), 237–267.

Burgman, M. A., Keith, D., Hopper, S. D., Widyatmoko, D., & Drill, C. (2007). Threat syndromes and conservation of the Australian flora. *Biological Conservation*, *134*(1), 73–82. doi:10.1016/j.biocon.2006.08.005

Bushley, B. R., & Khatri, D. B. (2011). *REDD+: Reversing , Reinforcing or Reconfiguring Decentralized Forest Governance in Nepal?*

Cambodian League for the Promotion and Defense of Human Rights (LICADHO). (2015). Cambodia's Concessions.

Cambodian National REDD+ Taskforce Established. (2013). *UN-REDD Programme Newsletter*.

Center for International Forestry Research (CIFOR). (2009). *Simply REDD*.

Chandran, P. (2012). Voices of the forest: building partnerships for community forestry in Cambodia. *Forestry*, 1–4. Retrieved from http://www.recoftc.org/site/uploads/content/pdf/building partnerships for CF in Cambodia UNFF_206.pdf

Chang, H. (2007). *Bad Samaritans: The Myth of Free Trade and the Secret History of Capitalism*. Bloomsbury Press.

Chervier, C., Neang, M., & Depres, C. (2010). Emergence of the notion of environmental services (ES) in forest conservation policies and the international influence: field evidences from Cambodia. *Cerdi.Org*, (1). Retrieved from http://www.cerdi.org/uploads/sfCmsContent/html/323/Déprés.pdf

Chhatre, A., & Agrawal, A. (2009). Trade-offs and synergies between carbon storage and livelihood benefits from forest commons. *Proceedings of the National Academy of Sciences of the United States of America*, *106*(42), 17667–70. doi:10.1073/pnas.0905308106

Cifor, G. M., & Cifor, M. B. (2014). No forest , no NTFPs for rural communities in Cambodia, (67), 1–4.

Community forestry adaptation roadmap to 2020 for Cambodia. (2014). Bangkok, Thailand.

Community Forestry Redd Project: Oddar Meanchey, Cambodia. (2015). *Forestry Administration, PACT Cambodia, and Terra Global Capital (TGC)*.

COP 11 and COP/MOP 1 Highlights. (2005). *Earth Negotiations Bulletin (ENB)*, pp. 11–12.

COP 13 and COP/MOP 3 Highlights. (n.d.). Bali, Indonesia: International Institute for Sustainable Development (IISD).

COP 13 and COP/MOP 3 Highlights. (2007). *Earth Negotiations Bulletin (ENB)*, *12*(345).

Daily, T. C. (2012). Carving Up Cambodia. *Weekend*, 10.

Dhiaulhaq, A., Yasmi, Y., Gritten, D., Kelley, L., & Chandet, H. (2014). Land grabbing and forest conflict in Cambodia : Implications for community and sustainable forest management. In *Forests under Pressure: Local Responses to Global Issues* (pp. 205–216).

Earth Negotiations Bulletin (ENB). (2005). Summary of the Eleveth Conference of the Parties to the UN Framework Convention on Climate Change and First Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol. Montreal, Canada: International Institute for Sustainable Development (IISD).

Economic Land Concessions in Cambodia: A Human Rights Perspective. (2007). Phnom Penh.

Elliott, V., Lambert, F., Phalla, T., & Sothea, H. (2011). Biodiversity Assessment of the REDD Community Forest Project in Oddar Meanchey Cambodia, (January), -. Retrieved from http://www.hcvnetwork.org/resources/assessments/Oddar Meanchey Biodiversity Assessment 2011.pdf

FAO. (2005). *Forest Resources Assessment*. Rome.

FIFTH CONSOLIDATED ANNUAL PROGRESS REPORT UN-REDD PROGRAMME FUND. (2014). Lima, Peru.

Fisher, R., & Lyster, R. (2013). Land and resource tenure : the rights of indigenous peoples and forest dwellers. In R. Lyster, C. Mackenzie, & C. Mcdermott (Eds.), *Law, Tropical Forests and Carbon: The Case of REDD+* (pp. 187–206). Cambridge University Press.

Fosci, M. (2013). Balance sheet in the REDD+: Are global estimates measuring the wrong costs? *Ecological Economics*, *89*, 196–200. doi:10.1016/j.ecolecon.2012.11.022

Gardner, T. a., Barlow, J., Sodhi, N. S., & Peres, C. a. (2010). A multi-region assessment of tropical forest biodiversity in a human-modified world. *Biological Conservation*, *143*(10), 2293–2300. doi:10.1016/j.biocon.2010.05.017

Gray, J. A. (2002). *Forest Concession Policies and Revenue Systems: Country Experience and Policy Changes for Sustainable Tropical Forestry* (No. 522).

Guimaraes, L., Ogonowski, M., & Movius, D. (2011). *REDD+ design in Cambodia, Indonesia and Mexico: Lessons to inform international REDD+ policy development*. *Center for Clean Air Policy*.

Hansen, M. C., Potapov, P. V, Moore, R., Hancher, M., Turubanova, S. a, & Tyukavina, A. (2013). High-Resolution Global Maps of 21st-Century Forest Cover Change. *Science*, *342*(November), 850–853. doi:10.1126/science.1244693

Hardin, G. (1968). The Tragedy of the Commons. *Science*, *162*, 1243–1248. doi:10.1126/science.162.3859.1243

Herold, M. (2009). *An assessment of national forest monitoring capabilities in tropical non-Annex I countries*. Retrieved from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:An+assessment+of+national+forest+monitoring+capabilities+in+tropical+non-Annex+I+countries+:+Recommendations+for+capacity+building+Prepared+by#0

Institute for Global Environmental Strategies (IGES). (2013). *REDD in Community Forests - Oddar Meanchey, Cambodia*.

IPCC Fifth Assessment Synthesis Report. (2014).

Kelly, A. B. (2011). Conservation practice as primitive accumulation. *Journal of Peasant Studies*, *38*(February 2015), 683–701. doi:10.1080/03066150.2011.607695

Kishor, N., & Damania, R. (2007). Crime and Justice in the Garden of Eden: Improving Governance and Reducing Corruption in the Forestry Sector. In J. E. Campos & S. Pradhan (Eds.), *The Many Faces of Corruption: Tracking Vulnerabilities at the Sector Level* (pp. 89–114). The World Bank.

Kuik, O. (2014). REDD+ and international leakage via food and timber markets: A CGE analysis. *Mitigation and Adaptation Strategies for Global Change*, *19*, 641–655. doi:10.1007/s11027-013-9527-2

Kyoto Protocol Reference Manual: On Accounting of Emissions and Assigned Amount. (2008).

Lang, C. (2009). What Came Out of Copenhagen on REDD. *REDD-Monitor*.

Lang, E. (2014). Military clearing of community forests in Oddar Meanchey, Cambodia.

Larson, A. M., Brockhaus, M., Sunderlin, W. D., Duchelle, A., Babon, A., Dokken, T., … Huynh, T. B. (2013). Land tenure and REDD+: The good, the bad and the ugly. *Global Environmental Change*, *23*(3), 678–689. doi:10.1016/j.gloenvcha.2013.02.014

Lederer, M. (2011). From CDM to REDD+ — What do we know for setting up effective and legitimate carbon governance? *Ecological Economics*, *70*(11), 1900–1907. doi:10.1016/j.ecolecon.2011.02.003

Lyster, R. (2013). International legal frameworks for REDD + : ensuring legitimacy. In R. Lyster, C. Mackenzie, & C. Mcdermott (Eds.), *Law, Tropical Forests and Carbon: The Case of REDD+* (pp. 3–25). Cambridge University Press.

Mahanty, S., Suich, H., & Tacconi, L. (2013). Access and benefits in payments for environmental services and implications for REDD+: Lessons from seven PES schemes. *Land Use Policy*, *31*, 38–47. doi:10.1016/j.landusepol.2011.10.009

Malhi, Y. (2010). The carbon balance of tropical forest regions, 1990–2005. *Current Opinion in Environmental Sustainability*, *2*(4), 237–244. doi:10.1016/j.cosust.2010.08.002

Malhi, Y., & Marthews, T. R. (2013). Tropical forests : carbon , climate and biodiversity. In R. Lyster, C. Mackenzie, & C. Mcdermott (Eds.), *Law, Tropical Forests and Carbon: The Case of REDD+* (pp. 26–43). Cambridge University Press.

Malhi, Y., Roberts, J. T., Betts, R. A., Killeen, T. J., Li, W., & Nobre, C. A. (2008). Climate change, deforestation, and the fate of the Amazon. *Science (New York, N.Y.)*, *319*(5860), 169–172. doi:10.3832/efor0516-005

Mcdermott, C. (2013). REDD+ and multi-level governance : governing for what and for whom ? In R. Lyster, C. Mackenzie, & C. Mcdermott (Eds.), *Law, Tropical Forests and Carbon: The Case of REDD+* (pp. 84–102). Cambridge University Press.

Miles, L., & Kapos, V. (2008). Reducing greenhouse gas emissions from deforestation and forest degradation: global land-use implications. *Science (New York, N.Y.)*, *320*(5882), 1454–1455. doi:10.1126/science.1155358

Milne, S. (2013). Under the leopard's skin: Land commodification and the dilemmas of Indigenous communal title in upland Cambodia. *Asia Pacific Viewpoint*, *54*(3), 323–339. doi:10.1111/apv.12027

Milne, S., & Chervier, C. (2014). *A review of payments for environmental services (PES) experiences in Cambodia* (No. 154). Bogor, Indonesia.

Morales, E. (2010). La naturaleza, los bosques y los pueblos indígenas no estamos en venta. Bolivia.

Naren, K., & Peter, Z. (2014). As Forests Fall, Carbon Credit Plan Faces Collapse. *The Cambodia Daily*.

Nathan, I., & Boon, T. E. (2012). Constraints and Options in Local Forest Management in Cambodia: Is Decentralization a Solution? *Journal of Sustainable Forestry*, *31*, 396–420. doi:10.1080/10549811.2011.588479

Neilson, J., & Leimona, B. (2013). Payments for ecosystem services and environmental governance in Indonesia. In R. Lyster, C. Mackenzie, & C. Mcdermott (Eds.), *Law, Tropical Forests and Carbon: The Case of REDD+* (pp. 207–229). Cambridge University Press.

Nepstad, D., Soares-filho, B. S., Merry, F., Lima, A., Moutinho, P., Carter, J., … Stella, O. (2009). The End of Deforestation in the Brazilian Amazon. *Science*, *326*, 3–4.

Ostrom, E. (n.d.). The Challenge of Common Pool Resources, *50*(4), 8–22.

Ostrom, E., & Gardner, R. (2014). Coping with Asymmetries in the Commons : Self-Governing Irrigation Systems Can Work. *The Jouranl of Economic Perspectives*, *7*(4), 93–112.

Palmer Fry, B. (2011). Community forest monitoring in REDD+: The "M" in MRV? *Environmental Science and Policy*, *14*(2), 181–187. doi:10.1016/j.envsci.2010.12.004

Pasgaard, M. (2013). The challenge of assessing social dimensions of avoided deforestation: Examples from Cambodia. *Environmental Impact Assessment Review*, *38*, 64–72. doi:10.1016/j.eiar.2012.06.002

Pasgaard, M., & Chea, L. (2013). Double Inequity? The Social Dimensions of Deforestation and Forest Protection in Local Communities in Northern Cambodia. *Austrian Journal of South-East Asian Studies / Österreichische Zeitschrift Für Südostasienwissenschaften*, *6*(2), 330–355. Retrieved from 10.4232/10.ASEAS-6.2-6\nhttp://ezproxy.library.uvic.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=94898780&site=ehost-live&scope=site

Peskett, L. (2013). REDD + and development. In R. Lyster, C. Mackenzie, & C. Mcdermott (Eds.), *Law, Tropical Forests and Carbon: The Case of REDD+* (pp. 230–250). Cambridge University Press.

Phelps, J., Webb, E. L., & Agrawal, A. (2010). Does REDD + Threaten to Recentralize Forest Governance. *Science*, *328*, 312–313.

Poffenberger, M. (2009). Cambodia's forests and climate change: Mitigating drivers of deforestation. *Natural Resources Forum*, *33*, 285–296. doi:10.1111/j.1477-8947.2009.01249.x

Poffenberger, M. (2013). Cambodia's Contested Forest Domain: A Historical Perspective. In M. Poffenberger (Ed.), *Cambodia's Contested Forest Domain* (pp. 3–33). Manila, Philippines: Ateneo de Manila University Press.

Poffenberger, M., De Gryze, S., & Durschinger, L. (2009). *Designing collaborative REDD projects: A case study from Oddar Meanchey Province, Cambodia. Community Forestry International*. doi:10.1002/tl.75

Poffenberger, M., & Smith-Hanssen, K. (2013). Communities and Forest Management. In M. Poffenberger (Ed.), *Cambodia's Contested Forest Domain* (pp. 37–59). Ateneo de Manila University Press.

Prachvuthy, M. (2011). *Land acquisition by non-local actors and consequences for local development. Netherlands Academy of Land Governance for Equitable and Sustainable Development*. Phnom Penh.

Printed by ADHOC February 2013. (2013), (February).

Putz, F. E., Dykstra, D. P., Heinrich, R., & Heinricht, R. (2014). Why Poor Logging Practices Persist in the Tropics Poor Logging Practices Persist in the Tropics. *Society for Conservation Biology*, *14*(4), 951–956.

Putz, F. E., & Redford, K. H. (2009). Dangers of carbon-based conservation. *Global Environmental Change*, *19*(4), 400–401. doi:10.1016/j.gloenvcha.2009.07.005

Putz, F. E., Sist, P., Fredericksen, T., & Dykstra, D. (2008). Reduced-impact logging: Challenges and opportunities. *Forest Ecology and Management*, *256*(7), 1427–1433. doi:10.1016/j.foreco.2008.03.036

Resosudarmo, I. A. P., Atmadja, S., Ekaputri, A. D., Intarini, D. Y., Indriatmoko, Y., & Astri, P. (2014). Does Tenure Security Lead to REDD+ Project Effectiveness? Reflections from Five Emerging Sites in Indonesia. *World Development*, *55*, 68–83. doi:10.1016/j.worlddev.2013.01.015

Robinson, E. J. Z., & Lokina, R. B. (2011). Efficiency, enforcement and revenue tradeoffs in participatory forest management: an example from Tanzania. *Environment and Development Economics*, *17*(01), 1–20. doi:10.1017/S1355770X11000209

Royal Government of Cambodia (RGC). (2003). *Kingdom of Cambodia Sub-Decree on Community Forestry Management*. Phnom Penh.

Royal Government of Cambodia (RGC). (2006). *Guideline (Prakas) on Community Forestry*.

Royal Government of Cambodia (RGC). (2009). *The National Green Growth Roadmap*. Phnom Penh.

Royal Government of Cambodia (RGC). (2010). *National Forest Programme 2010 - 2029*.

Rudel, T. K. (2013). The Quiet Woods. In R. Lyster, C. MacKenzie, & C. McDermott (Eds.), *Law, Tropical Forests and Carbon: The Case of REDD+* (pp. 68–83). Cambridge University Press.

Saracini, N., Asbirk, S., Sørensen, M. L., Haakansson, M., & Ulmer, K. (2011). *Stolen Land Stolen Future*.

Seangly, P. (2013). REDD+ forest clearing unabated: community. *The Phnom Penh Post*.

Slunge, D., Ekbom, A., Loayza, F., Guthiga, P., & Nyangena, W. (2011). *WORKING PAPERS IN ECONOMICS Can Strategic Environmental and Social Assessment of REDD+ Improve Forest Governance?* (No. 493) (Vol. 2473).

Smith, M. (2007). *Patronage and Corruption in Cambodian Forestry*. University of Oslo.

Sodhi, N. S., Koh, L. P., Brook, B. W., & Ng, P. K. L. (2004). Southeast Asian biodiversity: An impending disaster. *Trends in Ecology and Evolution*. doi:10.1016/j.tree.2004.09.006

Streck, C., & Scholz, S. M. (2006). The role of forests in global climate change: Whence we come and where we go. *International Affairs*, *82*(5), 861–879. doi:10.1111/j.1468-2346.2006.00575.x

Summary of the Cancun Climate Change Conference. (2010). *Earth Negotiations Bulletin (ENB)*, *12*(498), 1–30.

Summary of the Lima Climate Change Conference. (2014). *Earth Negotiations Bulletin* (Vol. 12). Lima, Peru.

Summary of the Thirteenth Conference of Parties to the UN Framework Convention on Cliamte Change and Third Meeting of Parties to the Kyoto Protocol. (2007). *Earth Negotiations Bulletin (ENB)*, *12*(354).

Supreme National Economic Council. (2007). The Report of Land and Human Development in Cambodia.

Terra Global Capital (TGC). (2012). *Reduced Emissions from Degradation and Deforestation in Community Forests – Oddar Meanchey, Cambodia*.

Terra Global Capital (TGC) and Pact Cambodia. (2013). *Oddar Meanchey Community Forestry REDD+*.

The Forestry Administration (FA). (2010). *Cambodia Forestry Outlook Study* (No. 32). Phnom Penh.

The World Bank World Development Indicators. (2012). *Cambodia*. Retrieved from http://databank.worldbank.org/data/views/reports/tableview.aspx

Thomas, S., Dargusch, P., Harrison, S., & Herbohn, J. (2010). Why are there so few afforestation and reforestation Clean Development Mechanism projects? *Land Use Policy*, *27*(3), 880–887. doi:10.1016/j.landusepol.2009.12.002

Thuon, R. (2013). *REDD+ And Tenure Securiity of Community Forestry: A Case Study of Oddar Meanchey Community Forestry REDD+ Project in Cambodia*. The University of Tokyo.

UN-REDD. (2008). *UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries*.

UN-REDD. (2010a). *Cambodia REDD+ Roadmap*. Washington D.C.

UN-REDD. (2010b). *National Programme Document - Cambodia*. Washington D.C.

UN-REDD. (2010c). *Programme Strategy 2011-2015*.

UNDP. (2012). Monks Community Forest.

UNFCCC. (2005). *Report of the Conference of the Parties on its eleventh session*. Montreal, Canada.

UNFCCC. (2009). Draft Decision CP. 15. *Conference of the Parties to the Climate Change Convention*, 1–5.

UNFCCC. (2012). *Draft Decision - COP16*. Cancun, Mexico.

UNFCCC. (2013). *Decision COP 19*. Warsaw, Poland.

United Nations. (1996). *Cambodia Forest Policy Assessment*.

United Nations. (1998). *Kyoto Protocol*. Kyoto, Japan.

United Nations. (2006). *Cambodia- Poverty Assessment 2006*. Phnom Penh. doi:35213-KH

United Nations. (2014). *CDM Fact Sheet*.

Venter, O., Brodeur, N. N., Nemiroff, L., Belland, B., Dollinesk, I. J., & Grant, J. W. A. (2006). Threats to Endangered Species in Canada. *BioScience*. doi:10.1641/0006-3568(2006)56[903:TTESIC]2.0.CO;2

Venter, O., Laurance, W. F., Iwamura, T., Wilson, K. A., Fuller, R. A., & Possingham, H. P. (2009). Harnessing carbon payments to protect biodiversity. *Science (New York, N.Y.)*, *326*(5958), 1368. doi:10.1126/science.1180289

West, S. (2010). Command without control: are market mechanisms capable of delivering ecological integrity to redd? *Law, Environment and Development Journal*, 298–321.

Wunder, S. (n.d.). Can payment for environmental services reduce deforestation and forest degradation? In *Realizing REDD+ national strategy and policy option* (Arlid Ange., pp. 213–223). Bogor, Indonesia: Center for International Forestry Research (CIFOR).

Wunder, S. (2005). *Payments for environmental services : Some nuts and bolts*. *Occasional Paper*. (No. 42).

Wunder, S. (2008a). How do we deal with leakage? In A. Angelsen (Ed.), *Moving Ahead with REDD: Issues, Options and Implications*. Bogor, Indonesia: Center for International Forestry Research (CIFOR).

Wunder, S. (2008b). Payments for environmental services and the poor: concepts and preliminary evidence. *Environment and Development Economics*, *13*(03), 279–297. doi:10.1017/S1355770X08004282

Yeang, D., & Brewster, J. (2012). REDD + Demonstration Activities in Cambodia : The Case of the Oddar Meanchey Community Forestry REDD + Project. *Austrian Journal of South-East Asian Studies / Österreichische Zeitschrift Für Südostasienwissenschaften*, *5*(2), 263–274.