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Reducing emissions from deforestation and forest degradation (REDD) projects: Lessons for future policy design and implementation

Hari Bansha Dulal¹ * Kalim U. Shah² and Chandan Sapkota³

¹The World Bank, 1818 H Street, NW, Washington, DC 20433, USA

² Faculty of Environmental Studies, York University, HNES 109, 4700 Keele St., Toronto, Ontario, Canada

³ South Asia Watch on Trade, Economics and Environment (SAWTEE), Baluwatar, Kathmandu, Nepal

Abstract

In response to the pressing global challenges of climate change, initiatives under the auspices of “reducing emissions from deforestation and forest degradation” (REDD) have since 2005 been implemented in over 30 developing and least developed countries. It covers nearly every significant and vulnerable forest ecosystem worldwide. In this study we review six representative initiatives, two each from Africa, Asia and Latin America. SWOT analysis (strength, weakness, opportunity and threat) is done to evaluate each initiative’s policy framework, design, implementation and results thus far. The main policy and project implementation factors that appear to lead to effective and successful REDD project outcomes include: having clearly formulated project design; governance, land tenure rights and capacity; equity and transparency; indigenous peoples’ rights and knowledge; local–international coordination; and enhancing local and institutional capacities. Based on these findings, we provide recommendations for future REDD policy action and project implementation to make it work for the poor and achieve its intended goals.

Keywords: REDD, developing countries, carbon dioxide emissions, deforestation, sustainable forest management, poverty reduction, biodiversity conservation.

1 Introduction

An estimated 24% of global CO₂ emissions can be attributed to land-use change and forestry activities, with the bulk of these emissions coming from the conversion of forest to agricultural lands in developing countries (Till & Francisco 2009). The changing pattern of land use from forests to agricultural acreage is emerging as a complex socio-environmental challenge. Poor forest management practices in production of forests, forest fires, overgrazing, overharvesting of forest products, illegal cutting of timber, forest pest outbreaks and forest disease are taking an additional toll, increasing the urgency for action. In response to these pressing global challenges, since 2005 the “reducing emissions from deforestation and forest degradation” (REDD) initiatives were implemented in over 30 developing and least-developed

*Corresponding Author, Tel: 1 571-288-1854; e-mail: hbdulal@gmail.com; hdulal@worldbank.org

countries, spanning nearly every significant and vulnerable forest ecosystem worldwide (Combes Motel et al. 2009). REDD projects transacted 3.1 MtCO₂ or 24% of the total volume transacted in the voluntary over-the-counter (OTC) market and generated US\$41.6 million. These credits came from just 11 projects, of which five were in Latin America and the rest in North America, Africa, Asia and Oceania (Australia). REDD credits have ranged from US\$9.43/tCO₂ to US\$17/tCO₂. The weighted average price in 2008 was US\$11.43/tCO₂ and in the first half of 2009 was US\$9.43/tCO₂. From 2004 to mid-2009, the Chicago Climate Exchange (CCX) alone registered a total of 11.5 MtCO₂ of forest carbon offsets representing 14% of all credits registered on the CCX. In 2008, the total value of forest carbon credit sales was US\$5.3 million. By mid-2009, the value was halved (US\$2.5 million) because of a reduction in price (Hamilton et al. 2010).

Although the main objective of REDD initiatives is the reduction of CO₂ emissions, they can also be designed to take into account other goals, such as biodiversity protection and sustainable livelihoods of rural communities. It can support livelihoods of local people through the diversification of agriculture, soil and water protection, direct employment and the use and sale of forest products and ecotourism. Meanwhile, communities can also build their capacity to adapt to the effects of climate change. Well-designed projects contribute to biodiversity conservation by restoring and protecting ecosystem services, saving threatened biota from extinction and maintaining ecological resilience and productivity (Stickler et al. 2009).

The intention of policymakers in developing REDD projects as a market-based mechanism is to create financial incentives to reduce forest-sourced greenhouse gases. It could reduce the logging of forests and replace the income lost in logging activity with that earned through carbon credits. The carbon credits are awarded for protecting the forests and as a result stopping the carbon emissions that are released from deforestation and degradation (Nature Editorial 2009).

In this paper we undertake an analysis of the strengths, weaknesses, opportunities and threats of six REDD projects being implemented in three different continents: Africa, Asia and Latin America. Representativeness of projects was taken into consideration while selecting them for analysis. The idea behind selecting projects from different regions was to identify similarity and differences in strength, weakness, opportunity and threat posed by REDD projects. The findings have greater implications for countries within and outside the regions in which projects are located, as they can be adapted to overcome weaknesses and minimize threats to REDD projects elsewhere. Based on the findings, we make policy and project implementation recommendations that can be considered in future modelling, conceptualization and implementation of REDD projects. By learning from past projects, the success and effectiveness of future models can be enhanced.

2 Analysis of REDD case studies

Even though during the course of our research, twenty-three case studies with documentation of the projects around the globe were examined, only six cases, two each from Africa, Asia and Latin America, based on their representativeness, were selected for detailed analysis. The set of six projects represent important points and findings that are generally reflective of the majority of projects analysed, and support our recommendations at the end of this paper. A SWOT policy analysis, which has often been used in the field of business and has been extended to natural resource management (Minang et al. 2008; Sarkar & Manoharan 2009; Nhantumbo & Izidine 2009; Hoare 2010) to assess a given decision, project or policy directive in a systematic manner, is used to discern the strengths, opportunities, weaknesses and threats within each case study. Figure 1 illustrates some of the criteria used for SWOT analysis.

(Figure 1 Here)

3. Selected REDD case studies

African case study 1: Democratic Republic of Congo (DRC)

The Democratic Republic of Congo (DRC) has the second largest tropical rain forest in the world. It covers 134 million ha and is a source of food, medicine, energy, livelihoods and revenue for about 40 million people. Of this, there are 400,000 to 600,000 indigenous Pygmy people (UN-REDD 2009). Deforestation rates in the DRC have been, to date, relatively low (0.3% per year) and has mainly been driven by the expansion of subsistence farming, which in turn results from the conversion of forests to shifting cultivation or small-scale permanent agriculture, and migration caused by the two wars that occurred between 1996 and 2003 and the resulting political instability. Illegal logging and establishment of palm oil plantations are also increasing deforestation. In the DRC, the Forest Carbon Partnership Facility (FCPF) has also been working in collaboration with UN-REDD since January 2009 by providing an initial grant for implementation. In March 2011, DRC signed the REDD readiness preparation proposal (R-PP), and received an implementation grant of US\$3.4 million (NORDECO 2011). This REDD initiative not only promises benefits with respect to reduction of greenhouse gases (GHG), but also is expected to aid poverty reduction.

Strengths

In October 2009, a decree to support REDD was recognized and was followed by formation of a National Coordination, an inter-ministerial committee and a national REDD committee (UN-REDD 2009). Civil society and indigenous people comprise one-third of the national REDD committee, which will enable them to make sound decisions and have an oversight role in the design, implementation and monitoring of the REDD process. A task force, including two members from civil society, was also established to liaise directly with negotiators at the UN Framework Convention on Climate Change (UNFCCC). The ongoing presence of civil society ensures that REDD mechanisms are equitable and favourable to local and forest-dependent populations. It will ensure that they will be informed and made a part of every motion that is passed and agreed. Reports and frequent consultations will continually be held with the indigenous people to constantly engage them in action plans and to contend with their concerns. The outcome documents must also be disseminated and made publicly accessible to enable transparency and accountability to civil society.

Weaknesses

Two of the core objectives of the REDD strategy are (i) to prepare a readiness plan (R-Plan) through a participatory and multi-stakeholder approach; and (ii) to inform and train stakeholders so they can actively participate in the REDD process. These objectives face challenges such as access to services and spread of divergent views and interests. As a result, the most important stakeholders, the immediate actors in the deforestation and forest degradation processes, will be the most difficult to reach and engage. These are chiefly several village communities and their customary authorities, the growing migrant populations seeking refuge from the conflict zones, and all the actors of the fuelwood/charcoal business involved in

wood collection, charcoal burning and further transportation to and distribution in major urban centres. In addition, the DRC is a huge country in which communications are difficult and interactions involving civil society can at times occur over extended periods. Therefore this should be taken into account when considering planning exercises. Moreover, the national joint programme (NJP) is written in English while the national language is French, implying that the proposal may take longer to be read by some civil organizations. Furthermore, it also has to be translated for the indigenous people.

As UN-REDD is a collaborative effort, it will be challenging to find a suitable balance between the international and national voices/actors. Due to the strong linkages between international and national NGOs in the country, the influence of external agents on local civil society organizations are occasionally difficult to evaluate. Hence, balancing expectations and pragmatism has been at times delicate (UN-REDD, 2009) as the REDD process is to be built progressively, and at times may fall short of civil society expectations.

One of the major weaknesses is that the state of implementation of main instruments for land and forest management in DRC. Some of these instruments, such as the 1967 Bakajika Law, the 1973 Land Tenure Law and the 2002 Forest Code, are unclear and often have significant inconsistencies. Several decrees needed to implement the reforms under the 2002 Forest Code and the 1973 Law are yet to be enacted (Hoare et al. 2008). Even though under the 2006 constitution, principles on land tenure are still to be determined under the law (article 123(3), the 1967 Bakajika Law and the 1973 Land Law), the state owns all land. Lack of passage of relevant decrees needed to implement the Land Law has created an ambiguous legal situation. Moreover, a lack of secure tenure could have serious implications for containment of deforestation and degradation of forests and also for revenue distribution. Also, the forest and land management sectors lack trained manpower, and the application of REDD will intensify the skills gap as specialists and professionals will be recruited internationally to head the implementation of REDD in DRC.

Opportunities

Among other benefits, the improvement of rural livelihoods, forest conservation, reduction of extreme poverty, economic, environmental and social benefits could result from REDD. The benefit sharing mechanism does not have start from scratch; it could be built upon or modified to suit the REDD context. Articles 88 and 89 of the Forest Code set up a system of '*cahiers des charges*', which calls for formation of a direct contractual relationship with the local community to improve socio-economic infrastructure. Forty per cent of the annual concession fee will be transferred to provinces and territories, to be used for community infrastructure under article 122 of the Forest Code (Counsell 2006).

An entire component of the 2009–2010 REDD work plan is devoted to capacity building. Information, education and communication workshops throughout the country are now underway as part of the UN-REDD DRC programme. These workshops would not only stimulate linkages and coordination among various stakeholders, but also enhance personal skills and knowledge of civil representatives. Even though stability may be a problem in DRC, REDD provides an opportunity to assist in stabilization through diversification of livelihoods and income, thus supporting the efforts of the strong UN presence.

Threats

About 10% of the area of DRC is considered too unstable for the application of REDD projects. Even though the DRC contains more forested areas than any other African state, the country, especially the eastern region that contains dense forests, suffers from constant conflicts. It should be realized that simply containing deforestation in remote areas plagued by violence by handing over authority to forest dwellers might not completely stop the ongoing deforestation and degradation of forests. There are issues regarding poor governance, which is

the greatest threat to the success of REDD projects. It is of crucial importance that the design of the REDD strategy include counter-corruption precautions to prevent designs that can be ambiguous and encourage illegitimate rent-seeking behaviour. Also, even though the government is gradually being decentralized, accessing conflict-hit and remote areas is difficult due to a lack of infrastructure and the uneven terrain. Civil society identifies the government as being indulgent to logging activities, often conflicting with human development objectives (UN-REDD, 2009). In contrast, the government regards civil society as an everlasting advocacy, with little concern for policy-making and addressing the economic and development challenges of the country. Additionally, the numerous stakeholders do not always work together and there is an element of mistrust. A lack of government capacity, accountability and effective judicial systems are barriers towards implementation of REDD, which aims to attract investors and channel the flow of funds (Bond et al. 2009).

In the DRC, logistics are difficult and expensive (especially for field projects) due to the lack of infrastructure. Hence, there is a requirement for logistical support and capacity building at all levels and at all locations. Furthermore, land tenure and indigenous rights is a particular challenge for the application of REDD. Disagreements are common between the government and indigenous peoples with respect to land ownership because technically land rights are based on the concept of national government ownership.

Table 1: SWOT analysis of the DRC REDD programme

<p>Strength</p> <ul style="list-style-type: none"> • One-third of REDD committee is comprised of civil society and indigenous people 	<p>Weakness</p> <ul style="list-style-type: none"> • Difficult to reach out to all stakeholders due to geography and divergent interests of different groups • Language and legal hurdles • Lack of qualified manpower
<p>Opportunity</p> <ul style="list-style-type: none"> • Improvement of rural livelihoods, forest conservation, reduction of extreme poverty, economic, environmental and social benefits • Contribute to political and economic stability 	<p>Threat</p> <ul style="list-style-type: none"> • Conflict and poor governance • Distrust between civil society and government • Lack of infrastructure and disagreements over land tenure and indigenous rights

African case study 2: Tanzania

Tanzania's 38.8 million ha of forest represent 41% of the total land area. Its rate of deforestation is estimated to be about 91,000 ha per year. Forests are closely interlinked with Tanzanians' livelihoods and provide a source of energy to approximately 90% of Tanzania's population. About 13 million ha of the forests have been gazetted as forest reserves, including 83,000 ha of industrial plantations and 1.6 million ha of strategic forests, such as water catchments and mangroves owned and managed by the central and local governments through the Forest and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism (United Republic of Tanzania 2009). Despite control of forests by the government, there has been consistent deforestation and degradation. Against this backdrop, the government considers its REDD policy a viable option that can provide opportunities for the country to meet its obligations of managing forests and woodlands on a sustainable basis and at the same time respond to poverty reduction initiatives. The preparation of the REDD readiness preparation proposal (R-PP), including pilot projects and a national preparation strategy, are facilitated by a grant from the Norwegian Government (NORDECO 2011).

In total, nine pilot projects on the forest sector and its resources are being conducted mainly by NGOs with the aim of providing relevant background information, particularly on reference scenarios. One such project is administered by the African Wildlife Foundation (AWF). Funded by the Norwegian Government, this 3-year project (2010–12) aims at mitigating climate change by conserving Kolo Hills Forests as well as reducing poverty among target communities in the project area. In addition, it also prepares local stakeholders to enter carbon trading successfully. Another is Hifadhi ya Misitu ya Asili (HIMA), which aims at promoting a pro-poor gender-equitable approach to community forest management in 29 community forest sites in seven districts of Unguja (South Unguja, North B Unguja and Central Unguja districts) and Pemba (Wete, Micheweni, Chake Chake and Mkoani districts) Island in Zanzibar. By piloting carbon financing for REDD, this project provides forest-dependent communities with secure property rights, equitable rewards for providing ecosystem services and other livelihood benefits, and informs the priorities of Zanzibar in the national REDD strategy (United Republic of Tanzania 2009).

Strengths

The REDD project is aimed at poverty reduction, improving livelihoods and ensuring ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility. From this project it is expected that there will be improvement in quality of life and social wellbeing of communities, sustainable use of forest products and resources, improved good governance of the forest resource base, biodiversity conservation in hot spots and forest conservation leading to enhancement of water quantity and quality. The strength of this programme is its focus on partnerships with local communities to protect the biodiversity of Tanzania's Arusha, Kilimanjaro, Morogoro and Tanga districts. Community participation informs all stakeholders of decisions made to protect biodiversity. Already, as a result of involvement in joint forest management, communities have reported improvements in forest condition, including improved water flow and reduced illegal activity.

Weakness

There may be risks linked to policy or legislation in Tanzania, e.g. on land and carbon rights, national land-use planning, equitable payment modalities, conflicting clauses or elements in sector policies that could have an adverse impact on the success of REDD. It is also possible that funds budgeted for these activities are not realistic because of inadequate knowledge of the costs of some activities. Lack of linkage between the proposed REDD project and existing conservation approach could be a problem. Undefined ownership of large areas of forestland and general land, inadequate financing of the forest sector and inadequate technical capacity can be problematic. Also, insufficient capacity to address issues of leakage and permanence is a major weakness. Because commercial lands are not a priority for conservation, the government has little incentive to use royalties from commercial forestry to pay local communities.

Opportunities

Many participating farmers and communities will be able to benefit from carbon markets. An increase in employment and foreign exchange earnings through sustainable forest-based industrial development and trade is expected. The livelihoods of forest-adjacent communities will be improved. Unlike many countries in Africa, Tanzania is well placed to benefit from REDD programmes because of its stable socio-political situation, and well-established participatory forestry management (PFM) programme. It is more than a decade since Tanzania adopted participatory forest and wildlife management approaches, such as community-based forest management (CBFM), joint forest management (JFM) and wildlife management areas (WMAs), having found that policing and law enforcement efforts alone are ineffective (Forest Trends 2009). The much needed local institutions and social capital that ensure equitable benefit sharing and sustenance of REDD projects are already available, even though their level may differ from area to area.

Threats

Like in many African countries, land tenure could emerge as one of the major barriers towards implementation of REDD projects. Land can only be acquired through custom/tradition or a grant from the commissioner for lands, who administers land on behalf of the president (as set out in the National Land Policy). Land, according to the 1999 National Land Act and Village Land Act, is divided into three categories: village, general and reserved. Tree tenure in Tanzania is strongly linked to land tenure, as the Land Act clearly states that land includes the

surface of the earth, the soil below the surface and all substances other than minerals or petroleum (Forest Trends 2009). This inference makes carbon property rights quite complicated. Lack of feasible means among forest-dependent communities to accommodate drivers and agents of deforestation poses a significant threat to long-term viability of REDD projects in Tanzania. Other threats include shifting cultivation, annual wildfires, harvesting for wood fuel, poles and timber, and heavy pressure for conversion to other competing land uses, such as agriculture, livestock grazing, settlements and industrial development.

Table 2: SWOT analysis of Tanzania’s REDD programme

Strength <ul style="list-style-type: none"> • Community participation 	Weakness <ul style="list-style-type: none"> • Policy hurdles in implementation • Inadequate knowledge and financing
Opportunity <ul style="list-style-type: none"> • Increase in employment and foreign exchange reserves • Strengthening of local institutions and social capital 	Threat <ul style="list-style-type: none"> • Complicated land tenure and land rights • Shifting cultivation and deforestation

Asia case study 1: Nepal

Nepal is a land-locked mountainous country consisting of five physiographic zones: (a) High Himal, (b) High mountains, (c) Middle hills, (d) Siwaliks and (e) Terai. Each is characterized by different land uses and capabilities, and forests play different roles in the landscape and have different social and economic potentials. In Nepal, forests are considered one of the most important natural resources as they serve three important functions: production of timber and non-timber forest products (NTFPs), protection of the natural environment and regulation of atmospheric conditions (Dhital 2009). There has been a decline in forest area in all ecological zones. In Himal, from 1991/1992 to 2001/2002, 5,246 ha or 2.24% of the forest was lost. The decline, however, is not limited to Himal; during the same period, the total forest area in the hills fell by 1,545,203 ha, from 42.8% of the total land area in 1991/1992 to 28.88% in 2001/2002. There was a 13.9% decline in forest area in the hills over a 10-year period. Decline in forest area in the hills resulted mainly from increases in the other forms of land use. Cultivated land area increased by 76,708 ha, from 16.61% of the total land area in 1991/1992 to 17.96% in 2001/2002. Likewise, uncultivated and other forms of land use also increased from 2.36% and 2.58% in 1991/1992 to 4.21% and other 20.23% in 2001/2002, respectively. In the Terai, 9,351 ha of forest were lost between 1991/1992 and 2001/2002. The overall forest area in the Terai, which accounted for 49.25% of the total land area in 1991/1992, was reduced by 3.31% (Kanel et al. 2009).

The ongoing deforestation and degradation undoubtedly provide potential for developing a national REDD framework. In 2008, the World Bank announced Nepal as one of 14 countries designated to receive funds for conserving their tropical forests under an innovative carbon finance scheme. Nepal joined the World Bank’s Forest Carbon Partnership Facility (FCPF) based on approval of their R-PIN in August 2009, and as a result, received a US\$200,000 preparation grant. The R-PP was submitted in 2010 and approved in October 2010. Since final approval of the R-PP, Nepal signed an agreement for a US\$3.4 million readiness grant in March 2011 (NORDECO 2011).

Strengths

The World Bank's FCPF scheme allows each country to design its own REDD framework so that it will be specific to the country. Nepal could use its own socio-political and geographical situation and formulate a plan best suited for its conditions. Considerations can thus focus on impending forest policy changes, land tenure, concerns of forest dwellers and institutional capacity to operationalize REDD (Kotru 2009). Lately, Nepal has been working towards democratic and sustainable management of forests by institutionalizing community governance of forests, which has decreased the rate of deforestation. In addition, there have been recommendations for future forest policy, such as helping to develop the forest sector to meet growing demands for forest products; efforts to link the poorest groups into market opportunities; examining the forest sector contribution to carbon sequestration; equitable benefit sharing with the grassroots beneficiaries; and improved governance of monitoring and evaluation systems. Some of these have clear links to establishing a system for REDD implementation. Nepal already has local institutions for forest governance, monitoring and forest product sale. More than 14000 community forestry groups (CFUGs) engaged in sustainable management of more than one million hectares of forest have been successful in reversing past trends of deforestation (Ojha et al. 2008). Established CFUGs with vast networks from local to national level create opportunities for REDD projects to operate smoothly. Much needed institutional forest governance, monitoring, carbon marketing and benefit sharing are, to a large extent, already in place in the form of CFUGs.

Weaknesses

Despite the above strengths, some weaknesses exist that could hinder smooth REDD implementation. These include old forestry plans and legislation, lack of coordination and cooperation between departments, low levels of awareness on REDD, lack of capacity, technical challenges with regards to methods of carbon stock monitoring, assessment and reporting and the need to develop benefit-sharing mechanisms to benefit the poor (McNally et al. 2009). Even though the REDD programme promises a higher income for poor communities, concerns have been raised by local groups about possible detrimental impacts of REDD. They are worried that their way of life and the forest on which many people depend may be under threat from REDD schemes. These insecurities will be addressed through their participation in stakeholder meetings to develop the programme document towards REDD readiness. One major weakness is that communities have never been involved in forest carbon monitoring and carbon trade. Even though there are tools and techniques available to monitor forest carbon, they cannot be applied immediately to Nepal's context, where geo-physical diversity predominates. Also, it is not clear how community-based carbon forestry can become part of a resilient, equitable and effective instrument for livelihood enhancement (Ojha et al. 2008).

Opportunities

The REDD programme will present an opportunity for Nepal to be resourceful and innovative and focus on the global agenda of climate change without compromising the interests of poor and indigenous peoples. One of the greatest opportunities is its proactive community approach to forest management. This provides a clear opportunity for converting REDD into tangible incentives, generating sufficient value addition to motivate the state and its forest communities (McNally et al. 2009). Likewise, because Nepal has many poor communities, REDD presents a way to explore financial instruments attached to good governance elements that bring a self-sustaining forest sector to the fore. A large number of robust and empowered local community groups (forest user groups) have already demonstrated in the past that given sufficient support, socio-economic benefits can be provided to poor and socially excluded

members of society (Ojha et al. 2008). Using these for equitable distribution of revenue generated through REDD could have transformatory effects both at household and community level. In addition to providing opportunities for institutionalizing good governance in the forestry sector, REDD might help build institutional and technical capacities of stakeholders to benefit from emerging global carbon trade (Kotru 2009). Meanwhile, the obvious benefit of the REDD regime is an increased potential to deliver biodiversity conservation.

Threats

The major challenges to implementing REDD strategies in Nepal are: a) policy and institutional aspects, b) financial instruments, c) capacity development, and d) equity and inclusiveness (Kotru 2009). Since Nepal has just emerged from a violent 10-year insurgency, there has been little focus on forest governance, thus hampering progress in updating legislation and enforcement, particularly on illegal logging and encroachment in the Terai. Therefore, there is a need for building blocks to be put into place for Nepal to become REDD ready. Capacity building will further prepare the country. Social capital has been seriously damaged, first by the violent insurgency, which exploited ethnic sensibilities, and recently by an ethnic uprising. As forest-dependent ethnic communities are mostly indigenous, convincing them and matching their expectations might be more challenging than anticipated.

Rampant deforestation and degradation of forests in the Terai, which contains natural block forests with relatively better capacity to sequester carbon, poses the biggest threat to long-term viability of REDD initiatives in Nepal. Past efforts to contain deforestation and degradation in the region have largely failed because many of the drivers of deforestation are outside the forest sector. Trans-boundary economics across the open borders, ethnic tensions, political unrest and lack of incentives to the marginal poor who depend on local resources for their livelihoods are some of the factors outside the forest sector (Ojha et al. 2008). Moreover, the Nepali government's inflexibility and traditional bureaucratic mindset, which is behind the slow decision-making process, poses a serious threat. National accounting standards for deforestation and forest degradation are needed for REDD to succeed, which in Nepal are currently poor and inconsistent (Pokharel & Baral 2009).

Table 3: SWOT analysis of Nepal's REDD programme

<p>Strength</p> <ul style="list-style-type: none"> Community governance and institutions for forest management already exist 	<p>Weakness</p> <ul style="list-style-type: none"> Outdated forestry laws and regulations Threat to indigenous communities and their livelihoods
<p>Opportunity</p> <ul style="list-style-type: none"> Proactive community participation Building institutional and technical capacities 	<p>Threat</p> <ul style="list-style-type: none"> Policy and institutional rigidity Rampant deforestation and degradation in Terai

Asia case study 2: Indonesia

Indonesia has some of the highest deforestation rates in the world today. The Ulu Masen forest Aceh Province, is the last large unprotected fragment of rain forest on Sumatra, an island ravaged by decades of rampant deforestation. The Ulu Masen REDD project aims to protect the

750,000 ha of biologically rich rain forest, decrease projected deforestation rates by 85%, and thereby reduce CO₂ emissions by 101,095,427 tonnes over 30 years (Cortez 2009). At a projected price of \$US5 per ton, offset VER credits could generate US\$16.85 million per year (McNally et al. 2009). The carbon credits predicted to be generated annually will help to finance the conservation of the forest's rich biodiversity and development projects for local communities.

Strengths

The project's activities will reduce deforestation of Aceh Province's endangered Ulu Masen forest by 85%. To improve forest governance, the project seeks establishment of community agreements. It has created employment for local people as wardens to conduct forest monitoring and patrolling. The project will designate 750,000 ha as 'carbon forests' (presently 150,000 ha of conversion forest and 350,000 ha designated for timber production), which will result in approximately 3.4 million tonnes of avoided CO₂ per year for the 30-year project life. The project will use the carbon finance to assist reforestation and restoration of mangroves, fruit tree gardens, coffee plantations and woodlots. The project involves habitat and wildlife conservation, sustainable development and capacity building. Through selected case study analysis of REDD, Bond et al. (2009) found that enforcing traditional rights in the case of Ulu Masen will have potential livelihood impacts. The Ulu Masen project demonstrates that a sub-national approach is ideally suited to carbon financing and mobilizing significant private sector investment. Its innovative project design that adopts a holistic vision of REDD, such as promotion of 'green' agriculture in organic coffee, cacao, rubber and oil palm, is a result of private sector involvement. Overall, despite the overlapping and contradictory regulations that provide minimal and insecure recognition of customary rights, the quick gains of the project demonstrates financing, efficiency and innovation benefits that a project-based approach can provide. It demonstrates that while extensive work remains to be done, the REDD concept has potential to become a viable and scalable climate change mitigation strategy (Clarke 2010).

Weaknesses

Weaknesses of this project include lack of experience, long process in marketing, high expectation in community and government for REDD to yield results in short term, and lack of benefit sharing mechanisms for communities. Clarke (2010), in an analysis of the Ulu Masen project, found that the project design failed to appreciate the complexities, uncertainties and potential risks regarding unclear land tenure. This makes the long-term viability of the project questionable as equitable sharing of benefits is largely based on tenure security. Along with uncertainties on land ownership and tenure rights, the relationship between customary titles to land and modern state law is problematic. Lack of awareness of REDD and compliance with the law, which is weak both among the public and government officials, adds another layer of complexity (Bond et al. 2009). Another weakness is that a framework for benefit-sharing arrangements and the exact division of project revenue is yet to be established. The project design, which was finalized in late 2007 and was submitted for independent audit against climate, community and biodiversity (CCB) criteria, is silent about this. Economic viability of any REDD project is uncertain unless there is certainty over carbon property rights. Lack of clear and secure rights to sell REDD carbon credits to third parties creates a significant risk, which is unavoidable (Clarke 2010).

Opportunities

Through support for enhanced enforcement, community agreements, increased employment and income for local people, recruiting forest wardens, conducting forest monitoring and patrols, and improving synergies through law enforcement and other relevant agencies, the Ulu Masen project aims to exploit opportunities to curb illegal logging in Aceh. It

aims to do so by providing forest-dependent communities with opportunities to diversify their livelihoods and income. Forest-dependent communities living nearby will be provided with alternative livelihoods in the form of funding and technical assistance for their commitment to protect forests. In addition, a number of accounts such as community development funds, alternative livelihoods funds and community-based forestry funds will be established to provide incentives to local villages for involvement in forest protection. In order to introduce the necessary management changes that will allow forest-dependent communities' concessions to be included in the forest estate, a separate fund was established that can provide grants or operate as a revolving credit fund to support changes.

Threats

Short-term risks include baseline calculation risk, leakage risk and measurement risk. In the long term, risks may be sovereign, legal and enforcement, natural (e.g. fire, disease, pests) and climate change risks. One threat is illegal logging, since it has traditionally been a significant source of income for farmers in Ulu Masen. Poaching represents a further threat for target species. Legal uncertainty generates significant risk in the case of the Ulu Masen project. Even though the design of the project makes reference to recognizing customary forest tenure, there is no specific strategy mentioned to turn this into reality. There is insufficient evaluation of the potential legal contradictions between state and customary rights over the forest. Tenure and rights over forests subject to customary claims is not settled. In the case of Ulu Masen, the layers of uncertainty regarding title to land and carbon, the ambiguous regulatory framework, and uncertain provincial–central relationship, and undetermined benefit-sharing arrangements present significant project risks, which need to be resolved for equitable distribution of REDD revenue (Clarke 2010).

Table 4: SWOT analysis of Indonesia's REDD programme

<p>Strength</p> <ul style="list-style-type: none"> • Establishment of community agreements to manage forests • Viable scalable climate change mitigation strategy 	<p>Weakness</p> <ul style="list-style-type: none"> • Lack of experience and awareness of REDD • Unclear land tenure provisions
<p>Opportunity</p> <ul style="list-style-type: none"> • Enhanced enforcement and community agreements • Increase in employment opportunities and income for local people 	<p>Threat</p> <ul style="list-style-type: none"> • Illegal logging • Legal uncertainty

Latin America case study 1: Bolivia

The Noel Kempff Mercado Climate Action project (NK-CAP) is being implemented in the Noel Kempff Mercado National Park, northeast Bolivia. It consists of 1,582,000 ha from an original size of 642,000 ha in 1995. Emissions reduction goals are 5.8 MtCO₂ over 30 years (McNally et al. 2009). The NK-CAP is one of the world's first large-scale REDD projects, and is addressing drivers of both deforestation from conversion to agriculture by local communities and degradation from logging activities in timber concessions. In 2005, NK-CAP was the first REDD project to be verified by a third party using rigorous standards based on those developed for the Kyoto Protocol's clean development mechanism.

Strengths

The NK-CAP has been verified as having avoided 1,034,107 tonnes of CO₂ emissions. It is estimated to avoid a total of 5,838,813 tonnes of CO₂ emissions over the 30-year project lifespan. The project has raised US\$8.25 million in carbon financing (Virgilio & Marshall 2009). Even though the focus of REDD is carbon, forest carbon projects have the dual potential to both mitigate climate change and conserve important biodiversity. With enhancement of biodiversity, ecosystem resiliency improves. With commencement of the REDD project communities have become increasingly organized. Among other income generating activities, the project supported establishment of a sustainable community forest concession, guided by a sustainable management plan.

Weaknesses

Between 2001 and 2004, a total of 115 fires were detected. This led to discounting of carbon stocks by 5% to cover potential carbon losses from fire (Cortez 2009). Problems such as political and social instability and unclear land tenure, financial, technical or management failures raise a serious question about consistent carbon benefits from the project. Moreover, the distributional impacts of the project are uneven. The project has had limited success in providing sustainable development benefits to forest-dependent people. This has resulted in different outcomes for women and men. Approximately 30 men were employed annually for a several weeks to clear roads into the national park, whereas only two women from one village were employed as cooks when tourists came to the main park camp. Likewise, the park employed six or seven local men as park guards, who made up to US\$100 per month, which in the local context is a very reasonable salary. Except for one female forestry consultant involved in training the forestry team and the female coordinator of the ecotourism activities, all the technical staff directly involved in the project were male. Even though the project provided much needed income, especially women were not able to benefit directly from the project (Boyd 2002).

Opportunities

The program for the sustainable development of local communities improved access to basic services such as health, education and communication, whereas the community development programme emphasized community development by securing land title, assisting self-organization and supporting income generating activities such as community forestry and micro-enterprises. As a part of an agreement to investment in human capital formation, schools were refurbished, educational supplies purchased and scholarships provided to 120 primary and secondary school students to continue their studies in courses that were not available in the communities. Access to healthcare was expanded. The existing ill-equipped health clinic was refurbished to house a resident nurse. Another outpost in the area was converted into a micro-hospital, with a delivery room, laboratory and dental services (Virgilio & Marshall 2009). Socio-economic assessment revealed that, on average, the communities were benefiting from the project (Calderón 2005). In order to compensate for job losses due closed timber concessions and sawmills in the forest-dependent communities, those that lost jobs were provided with alternative livelihood opportunities. For example, in Florida, about 80 community members were hired to survey forest resources both inside and outside of the expansion area. Out of 26 full-time park guards, ten were from the local communities; six community members were trained as tourist guides (Asquith et al. 2002). Even though the project initially impacted the livelihoods of forest-dependent communities, there has been a relentless effort on the part of the project developers to create opportunities for them.

Threats

The threats to this project include fire, illegal activities, logging, land clearing, hunting and fishing with nets. Leakage is another major threat; since it is possible that project activities could displace emissions elsewhere, every attempt is made to account for the quantity of potential leakage. Specific safeguards are built into the NK-CAP design to help avoid leakage. Although all sectors have the potential for impermanence, forest carbon projects face particular scrutiny due to a perceived risk that poor management, fire, pests, etc., can lead to destruction of forests and subsequent CO₂ emissions. In the event of a forest fire or other damage, the CO₂ originally prevented will be released into the atmosphere. This means that twice the volume of CO₂ may be emitted as a result of the project. The government contends that offsets are subject to foreign investor’s tax.

Moreover, rising opportunity cost of land also poses a threat to the project as nearby communities may deem the existing income to be insufficient and revert to old habits. This could be further triggered by deterioration in law and order in the area. Lack of sufficient benefits may result in gradual loss of project participants, which in this case are local poor forest-dependent communities. Asquith et al. (2002) studied the NK-CAP and assessed whether forest protection carbon projects can significantly benefit local people. The research included 53 members of the communities of Florida, Porvenir and Piso Firme and 36 secondary stakeholders. The findings show that the long-term impact of NK-CAP on the local communities may well be positive, but in the short term, certain sections of local communities are financially poorer. The project needs to improve rural livelihoods if it is to remain viable in the long term. It may have to be redesigned so that local forest-dependent communities, including women and indigenous people, can benefit.

Table 5: SWOT analysis of Bolivia’s REDD programme

<p>Strength</p> <ul style="list-style-type: none"> • Organized communities • Sustainable management plan 	<p>Weakness</p> <ul style="list-style-type: none"> • Prone to forest fires • Limited success in providing sustainable development benefits
<p>Opportunity</p> <ul style="list-style-type: none"> • Improved access to basic services • Investment in human capital formation • Alternative livelihood opportunities 	<p>Threat</p> <ul style="list-style-type: none"> • Forest fires, illegal activities and logging • Rising opportunity cost of land

Latin America case study 2: Brazil

The Juma sustainable development reserve project for reducing greenhouse gases emissions from deforestation (Juma reserve RED project) encompasses 589,612.8 ha in the municipality of Novo Aripuanã, in the southeastern Brazilian State of Amazonas. The project involves establishment of a protected area for sustainable use in a region that would be almost completely deforested under the “business-as-usual” scenario if the current land-use practices in the Amazon region continue. In the absence of concrete measures, deforestation from protected areas in the State of Amazonas alone could emit close to 3.5 billion tonnes of CO₂ into the atmosphere (McNally et al. 2009). Through the revenues raised from sale of carbon credits, the State Government aims to implement all measures necessary to control and monitor

deforestation within the project site, enforce the law and improve the welfare of local communities (CCBA 2008).

Strengths

By 2050, implementation of the project's activities will contain the deforestation to about 329.483 ha of tropical forest, which would emit 189,7670,279 tonnes of CO₂ into the atmosphere in the expected baseline scenario for the Juma reserve (CCBA 2008). Generating social and environmental benefits in the project area is a main part of the region's conservation strategy. The fact that communities were not displaced during creation of the project is one of the greatest strengths. Lack of displacement during the project creation is expected to result in few, if any, arson and other disturbances. The project provided organizational, management and technical capacity-building activities to underscore the ownership and local people's management of the reserve, as well as to insure their involvement in decision-making and implementation of programmes, and in conservation and sustainable development efforts. Direct payment for environmental services (*Bolsa Floresta*) has several programmes in place to promote social inclusion of women, livelihood diversification of forest-dependent communities, and local development. The payment plan includes four kinds of fund distribution. First, individual families (*Bolsa Floresta Familiar*) are given a monthly payment of US\$25 through a debit card issued to a female member of the household. Second, families' associations (*Bolsa Floresta Associação*) under which a cash grant averaging US\$500 per month per association plus an in-kind grant of equipment (e.g. boat or Internet connection) is provided. Third, the social programme (*Bolsa Floresta Social*) whose main aim is to provide grants for social activities. Approximately US\$70,000 per year for each reserve, in the form of small investments (e.g. in education or health) complementing state and local government programmes is provided. Fourth, sustainable income generation (*Bolsa Floresta Renda*), under which around US\$70,000 per year is provided to each reserve to support income-generating activities based on sustainable land and resource use (Viana et al. 2009).

Weaknesses

The costs of monitoring in remote areas like the Juma reserve are very expensive. Infrastructure development will be important, but at the same time costly to the environment. The benefits resulting from the project may be reduced substantially if infrastructural development is to be carried out from the revenue generated through the project. There is a high likelihood of new road(s)/rails being built near or inside the protected forest and this could pose a problem. Land tenure is also uncertain and there is a chance of a high population density in the project area.

Opportunities

There will be income generation through promotion of sustainable businesses. Community organization and business training will be combined to improve local capacity in forest management and forest product extraction. Research and development of new technologies will allow for innovation in the quality and types of products local communities produce. Furthermore, market development activities will be undertaken to improve market access. This combination should enhance production of forest products from the local communities involved in the project. There is a clear opportunity for rural livelihood improvement as there is growing interest in supporting conservation efforts in the project area. As Juma is part of a broader initiative focused on payments for environmental services, called the *Bolsa Floresta* (forest conservation grant) programme, initiated by the Amazonas government and Brazilian private banking giant Bradesco, this initiative is being funded by a wide range of

players. For example, the Marriott hotel chain is financing Juma through voluntary contributions from guests. Approximately 6000 families committed to zero deforestation in all Bolsa Floresta projects benefit from total investments of US\$8.1million per year (Viana et al. 2009).

Community development, scientific research and education are other opportunities present in the REDD project. Education centres will be constructed to train and transmit scientific information to local communities in conservation efforts, as well as to provide opportunities for training of professionals specializing in biology, forest management, environmental education, etc. The communities will receive direct benefits for their contributions to conservation, such as access to clean water, healthcare, information, productive activities and other improvements in their quality of life. Furthermore, a portion of the financial resources generated by the project will be paid to traditional communities in the Juma Reserve for environmental services through establishment of the “Bolsa Floresta” programme. This translates into concrete and direct benefits for some of the most marginalized and vulnerable populations, who are dependent on the forest for their survival. Additional economic activities for the region will be developed based on a socio-economic study conducted as part of the creation of the reserve. Local household incomes will be increased by identifying, along with the community, their needs as they relate to equipment, training and development, as well as market opportunities for the sustainable use of natural resources. With this project the pro-chuva programme will improve rain water storage and treatment, A programme will be implemented at public schools to train teachers and distribute material so they can understand and disseminate information related to sustainability and climate change.

Threats

The major imminent threats to the natural ecosystems are illegal logging, mining, land grabbing for agriculture, cattle ranching and over-fishing. These threats have the potential to cause great damage to the integrity of the Juma reserve. Furthermore, the federal government recently announced plans to construct roads, which will directly affect the project area. The implementation of existing rules and regulations is a big problem in Brazil (Bond et al. 2009). Agricultural expansion resulting from land pressure also poses a major threat to permanence of the project. Viana et al. (2009) argue that in the project area, the biggest challenge is not how to reduce deforestation but how to finance the reduction, as the agricultural frontier in the Amazon is pushed by the multi-billion dollar per year economy. The costs involved to ensure permanence of the project is one of the major threats that needs to be dealt with if the targeted level of emissions reduction is to be achieved and sustained. According to Viana et al. (2009), significant expenditure is likely to be needed over and above the rewards to local communities and up to 40% of the total cost to ensure that permanent emission reductions are generated.

Table 6: SWOT analysis of Brazil's REDD programme

Strength <ul style="list-style-type: none"> • Control of deforestation • Social and environmental benefits • Good fund distribution system 	Weakness <ul style="list-style-type: none"> • Expense of monitoring in remote places • Uncertain land tenure provisions
Opportunity <ul style="list-style-type: none"> • Income generation • Improved local capacity in forest management 	Threat <ul style="list-style-type: none"> • Illegal logging, mining and land grabbing • Deforestation

4 Towards REDD best practice models for policy and project implementation

Carbon is already a marketable commodity and several communities around the world are cashing in on it. It is predicted that financial flows for greenhouse gas emission reductions from REDD could reach US\$30 billion a year (Laurance 2008). However, for REDD to achieve sustainable long-term reductions in emissions from deforestation and forest degradation, the North-South flow of funds under REDD mechanisms must be sufficiently large and consistent to diversify livelihoods of forest-dependent communities and support pro-poor development. Despite being just a few years old, some useful lessons can be learned from the existing policies, their design and implementation. Based on outcomes of the case study analyses discussed above, the following factors seem to determine the success and effectiveness of REDD initiatives, particularly those concerning its policy and implementation: project design, governance, land tenure rights and capacity, equity and transparency, indigenous peoples' rights and knowledge, local–International coordination and enhancing local and institutional capacity.

Project design: For the effectiveness of REDD initiatives, the boundaries, such as project area and leakage belt, timeframe and carbon pools, should be well defined beforehand. Historical land use and land cover change in the project area can be readily accessed using remote sensing technologies including GIS and maps. This would help in estimation of the stock of carbon and could be updated over time, depending on the scope of the project. Furthermore, the extent and location of deforestation must be assessed to identify drivers of deforestation in project areas. This can be done when forest data are acquired for REDD purposes. With respect to design and implementation, the case studies show that multiple stakeholder participation is central to the success of REDD schemes. It ensures that civil society understands and contributes to development of mechanisms that are applied to make the project a success. In this process, the main stakeholders are the communities that dwell in remote areas and rely solely on natural resources, whose consumption might be either sustainable or unsustainable. These stakeholders are the major drivers of forest removal to sustain livelihoods and their active participation is crucial to success.

Governance, land tenure rights and capacity: Poor forest governance and lack of proper land tenure are two of the most pressing challenges. An efficient governance mechanism is needed to implement REDD monitoring and evaluation for long-term success. Additionally, the main stakeholders (mostly poor communities that depend on forests for livelihoods) should have confidence in the REDD project that it will not threaten their livelihood options. Where appropriate, they have to be accorded land rights so that they have an incentive to protect the forests that are under REDD consideration. One way to deal with land tenure issues is to start REDD projects in government-owned land and then gradually transfer forests to local communities after proper infrastructure is in place. Evidence shows that REDD projects can be successfully carried out in land with diverse land tenure. For example, in 2008 the largest number of credits transacted (4.9 MtCO₂ 36.8%) in the voluntary carbon market was reported in government-managed lands. Of this, 22% was generated on state-managed protected areas; 27.8% (3.7 MtCO₂) of credit volume sold came from land involving collective or customary rights; and 22% (2.9 MtCO₂) of all credits over time were from privately owned land (Hamilton et al. 2010). Moreover, for effectiveness of the entire scheme, for all of these initiatives, should be complimented by enhancing capacity of government and local authorities to implement and supervise REDD projects (Skutsch & Van Laake 2008).

Equity and transparency: REDD activities – especially if financed through the carbon markets – involve complex arrangements among a wide range of stakeholders, all of whom need to have their interests accommodated in a balanced way. Hence, strong governance structures and

transparent procedures on design and implementation of sharing of socio-economic benefits must be defined and enforced in participating developing countries. If the baseline trends are set too low to maximize potential output of carbon credits, then it will disrupt the operation of market mechanisms (Zahabu et al. 2007). Worse, this under-reporting of baseline levels is too often susceptible to political interference. To avoid these pitfalls, it is vital to ensure equity and transparency, along with inclusive stakeholder consultation. This element emphasizes the benefit of developing a REDD scheme that is country-specific. Payment for ecosystem services (PES) can reduce social costs; however for PES to work at a larger scale, increased budget outlays vis-à-vis a command-and-control strategy and both legal and institutional challenges have to be overcome (Borner et al. 2011).

Indigenous peoples' rights and knowledge: As of now, the values indigenous groups attach to the forests are accounted for under the compensation schemes. The tangible and intangible values attached to forests by indigenous people have to be captured through estimation of opportunity costs. The effective participation of indigenous people (IP) and local communities (LC) in REDD design and implementation mechanisms will have strong linkages to environmental effectiveness (Pedroni et al. 2009). The forest sector in many developing countries presents challenges for IP and LC participation due to remote locations of communities, illegal forest exploitation, weak governance and lack of clarity regarding rights to land and natural resources. The strongest projects that have emerged so far have developed plans that not only protect biodiversity, but also meet people's needs and respect their cultural association with nature. Moreover, the knowledge gained by generations of forest-based communities is embedded in their culture and is part of daily forest management. If incorporated appropriately in REDD project design and implementation, their knowledge and practices will be a significant asset in the effective and efficient management of REDD projects.

Local–International coordination: Without proper coordination, the creation of necessary capacities to address the design, operation and monitoring issues and process is difficult, if not impossible. The participation of a large variety of actors in the governmental, non-governmental, private and academic sectors, among others, is necessary for the design and implementation of REDD mechanisms. Coordination is thus essential. Importantly, projects should be flexible enough to ensure access to benefits by the largest possible number beneficiaries (Skutsch & Trines 2008; Potvin et al. 2008). Experiences from developed countries can help enhance flexibility of REDD projects. For example, China could adapt US experience on how to practice sustainable forestry in a more market-based economy (Shao et al. 2011).

Enhance local and institutional capacity: Local and institutional capacities will, to a large degree, determine which community will benefit and how much from the REDD projects. In order to facilitate long-term monitoring of emissions reductions and equitable distribution of revenues, local and institutional capacity is important. A sound technical capacity is needed to develop measurement, monitoring and verification systems capable of incorporating these co-benefits into the framework of a REDD mechanism (Van Oosterzee & Garnett 2008). Most of the developing countries lack capacity on this front and the international community can substantially contribute in building up institutional capacities.

5. Conclusion

REDD is still a relatively new development in global climate change policy and very few projects have yet been developed worldwide. Experience, however, shows that when local

forest-dependent communities have greater autonomy and ownership, forest outcomes are better. Emerging lessons show that local communities restrict their consumption of forest products when they own forest commons, thereby increasing carbon storage. Rule-making autonomy and ownership are distinct and important institutional factors that influence forest outcomes. In developing countries, the transfer of forest ownership to local communities, coupled with payments for improved carbon storage, can contribute to climate change mitigation without adversely affecting local livelihoods (Chhatre & Agrawal_2009). With opportunities, there are a number of risks that needs to be carefully addressed while designing REDD projects. REDD might very well exclude people from forest land, causing demographic shifts, and the decline in tax revenues from commodity production and associated industries. It is thus necessary to recognize and appropriately compensate the full range of economic, social and political net costs of REDD, so that it does not create a disincentive to government investment in forested regions to the detriment of forest communities and regional development (Ghazoul et al. 2010). In many poor developing countries with a legacy of centralized control forest policy, there may be no institutions or local capacity required to make REDD work. In the absence of the required capacity, accuracy of estimates, consistency of measurements, comparability of methods and completeness of carbon pools may be questioned from time to time. In order to realize REDD potential and contribute to meeting the climate goals, forest carbon policy in these countries should be guided by immediate and substantial capacity building.

REDD policy, if designed properly, can contribute both to climate change mitigation and biodiversity conservation. However, in order to achieve these dual objectives, it should promote preservation of intact forests while including specific standards that protect biodiversity and ecosystems services, recognize the role forests play in the livelihood and culture of indigenous peoples, recognize land tenure rights, ensure equitable benefit sharing and channel funding to areas of high biodiversity. In poor developing countries many drivers of deforestation and biodiversity loss originate well outside the normal forestry domain and change with time and space. With an increase in demand for agricultural land, policies designed to manage already cleared land adjacent to forests will have to align with REDD polices. Failure to do so may trigger a land-use conflict with increases in demand for food.

Forest-dependent communities utilize the forest for many essential goods and services, such as food, water, firewood and medicines. Even though the REDD mechanism has the potential to improve the long-term availability of those goods and services by providing adequate and stable financing to protect the forest, like any other mechanism, not everyone will benefit equally. For long-term sustainability of REDD, the rewards received by the people that receive the least must be sufficient to forego deforestation activities. For long-term sustainability of REDD projects, rights and interests of people that depend the most on forests for survival but who likely receive the least, given their position in the society, must be safeguarded. One way of establishing that minimum reward required for making deforestation activities unattractive is through the establishment of carbon rights in national regulations. In the absence of financial benefits large enough to compensate for curtailed access to forests, poor forest-dependent households with limited livelihood opportunities may be forced to illegally procure resources, or in some extreme cases, completely opt-out of participation in REDD.

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Figure 1. Strength, weakness, opportunity and threat in REDD projects

