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Restoring and Conserving Khasi Forests: A Community-Based REDD Strategy from Northeast India

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Abstract: An initiative to Reduce Emissions from Deforestation and Forest Degradation (REDD) was launched in December 2007 at the Bali Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), yet little progress has been made in Asia in developing certified REDD projects, especially those that engage forest-dependent people. According to UNFCCC, REDD is a multilevel activity that involves both national policy and structures, as well as subnational projects involving local communities [1]. While many Asian nations are trying to create frameworks that link the national strategy to sub-national projects, in India this formal integration has yet to take place. As a consequence projects like the Khasi Hills Community REDD+ project fall outside the UNFCCC strategy and operate under voluntary standards (Plan Vivo) and markets. The project involves both avoided deforestation and reforestation components. The project is being implemented by a federation of ten Khasi tribal kingdoms, a major ethnolinguistic group in the Indian state of Meghalaya. Project experience may provide guidance regarding actions required to create a more enabling environment for community forest carbon projects in Asia. These findings may better inform the December 2015 21st UNFCCC Conference of Parties in Paris as they again address REDD strategy. The experience of this Khasi Federation [2] in designing and implementing a REDD project has led to the emergence of a modernizing forest management system that is helping to conserve and restore the Khasi's ancestral forests. Learning from this REDD project also illustrates the barriers that the Khasi communities have faced, including those imposed by national governments, certifiers, and carbon markets, that will likely constrain the expansion and replication of community-based climate initiatives. The author suggests some alternative policies and systems that may enable greater community participation in REDD projects.

Keywords: community forestry; REDD; indigenous governments; northeast India; Khasi Hills; payments for environmental services; PES

1. Introduction

Global concern over climate change has grown as empirical evidence mounts regarding increasing levels of atmospheric carbon that are contributing to a warming global climate, rising sea levels, and increasingly erratic climatic patterns. As a source of carbon emissions, forests have been an important topic during the past 20 meetings of the Conference of Parties to the UNFCCC that is seeking an international global agreement to address climate change. As the Green Alliance, a coalition of leading international environmental NGOs notes:

"Protecting and restoring ecosystems such as forests and peatlands also helps to reduce emissions. About one quarter of all human-induced emissions comes from agriculture, forestry and

other land use, mainly tropical deforestation and peatland degradation. This is recognized in global climate talks. The REDD initiative has the dual aim of reducing greenhouse gases and protecting forests in developing countries. Negotiations are underway to provide a financing mechanism, rewarding developing countries for protecting forests" [3].

Despite over a decade of United Nations-sponsored REDD negotiations a global agreement on forest carbon has yet to be finalized [4]. According to one World Bank report: "The lack of action on climate change not only risks putting prosperity out of reach of millions of people in the developing world; it threatens to roll back decades of sustainable development" [5].

Much of the international dialogue regarding REDD focuses on strategies to promote national carbon accounting systems (NCAS) with carbon revenues used to leverage national governments to change forest and land-use policies. While there is a clear need to adopt policies that conserve forests and constrain national drivers of deforestation, such as the leasing large forest areas for conversion to estate crops, it is doubtful that a national, top-down approach alone will address many local drivers of deforestation and degradation in an adequate manner. National REDD initiatives need to support sub-national and community-based REDD initiatives, especially emerging grassroots conservation initiatives as exemplified by this case study. Through community forestry strategies, localized REDD programs have the potential to address the needs of the rural poor in ways that create tenure security, a prerequisite for forest conservation, while channelling financial resources for alternative livelihood activities.

Globally, it is estimated that there are between 370 million [6] and 1.6 billion forest-dependent people and indigenous peoples According to Palmer, forest-dependent means "dependent on forest/woodland/tree-derived goods and services. The dependency includes water, fuelwood, shelter, medicinal plants and culinary herbs, nutritionally important forest fruits and other foods, timber, fodder, dry-season grazing, the broad suite of non-timber forest products (bamboos, rattans, gums, resins, latex, oils, *etc.*) [7]. Forest peoples are gaining political leverage, especially in countries like India, Indonesia, Nepal, and the Philippines, and are demanding recognition of their tenure and ancestral domain claims, as well as the rights to participate in any future REDD initiatives. Under India's recent Forest Rights Act (FRA), the Rights and Resources Initiative estimates that 50% of the nation's state forests are rightfully community lands, representing 40 million hectares and 150 million people [8]. Forest Trends reported a global doubling of the area of forest land officially reported to be owned or managed by communities between 1985 and 2000 representing 22% of all forests in developing countries [9]. Still, many NGOs remain skeptical concerning the likelihood that forest-dependent peoples will be able to benefit from REDD initiatives. In part this skepticism early experiences that suggest REDD will be controlled by national governments, corporate project developers, brokers, and carbon buyers, while communities will see little benefit and may even lose control over community forest lands. These concerns are warranted as the issues mentioned above are prevalent within the Asia region.

The Khasi Hills Community REDD Project was initiated to explore whether a group of forest-dependent communities could develop a successful REDD type project that could be certified under international standards and be used to finance conservation and restoration activities. While REDD policies have been a topic of global climate discussions for nearly a decade, there was little empirical evidence from Asia that sub-national projects could achieve REDD goals and other development objectives under existing project design and technical protocols. The Khasi Hills was selected as a site for this research activity based on the request of local communities to initiate a REDD project in order to slow and halt loss of communal forests upon which the villages are heavily dependent.

This paper is based on an applied research program to determine whether a REDD project, owned and managed by indigenous communities, could contribute to the improvement of environmental and socio-economic conditions. Key questions the study address include:

- Can indigenous groups and their institutions arrest or slow down processes of deforestation, in a context characterized by rapid change?
- Can a Payment for Environmental Services (PES) scheme under REDD serve as a catalyst in context like the one described, enabling indigenous groups to conserve and benefit from their forests?
- What constraints put at risk the successful and sustainable involvement of these indigenous groups in the conservation of their forests?
- What conditions contribute to the creation of an enabling environment for the successful implementation of community REDD schemes?

2. Background

Khasi communities of Northeast India possess indigenous forest conservation values and management systems reflected in an unbroken 500-year-old tradition of protecting their sacred forests and ancient stone megaliths. Indigenous institutions including multi-village governments (*hima*) and tribal village councils remain the active governance organisations for civil society at the local level. These institutions set and enforce traditional social norms and rules through participatory meetings and group activities that characterize Khasi society.

Khasi communities place a high cultural value on their forests, as reflected in their oral histories, and many people are concerned over forest loss. Rituals continue to be performed in sacred places within and around the forest, while rules for forest conservation and use are generally well-respected by the community. The Khasi also value their forests for their capacity to protect springs and stream beds and conserve wildlife. Equally important, the forests provide a diversity of food products including mushrooms, green leaves, fruits, and nuts that are an important contribution to the family kitchen. Bamboo and timber for construction and tools are drawn from community forests. A recent survey of four Khasi hills villages found that community members collected non-timber forest products from 137 different plant species found in the surrounding forests [10]. This high social and economic dependency upon the forests has energized the Khasi response to forest loss.

The Khasi Hills of Meghalaya is a propitious site for REDD pilot projects because of the long-established traditions of community forest management, the resurgence of community interest in strengthening protection of sacred groves and communal forests, and the recent high rates of deforestation that create opportunities for substantial CO_2 emissions reductions. Khasi community leaders approachedCommunity Forestry International staff at a workshop in Shillong, Meghalaya in 2005 to request institutional, technical, and financial assistance to strengthen the capacity of their traditional management systems to conserve and restore community forests. This request was in response to community concerns about degradation of forests and growing pressures on sacred groves and other natural resources both from their own community meeting fuelwood needs as well as from private sector firms engaged in quarrying, mining, and logging.

In the East Khasi Hills District where the project is located, between 2000 and 2006, forest loss exceeded a staggering 5 percent per year, contributing to rapidly deteriorating surface and ground water supplies, erosion, and sedimentation problems, and perceived changes in the micro-climate. Approximately 39 percent of forest lands in the project area are severely degraded as a result of unsustainable fuel wood harvesting, grazing, and fire, as well as by quarrying and timber extraction. Over 95 percent of families in the project area rely on fuelwood for cooking and heating.

Communities were also concerned about perceived declines in drinking water availability [11]. While the Khasi Hills has some of the highest recorded annual rainfall levels in the world, a longer and hotter dry season and deforestation are reported by community members to be causing growing water shortages. Growing threats to these valued ecosystems catalysed 62 villages within 10 indigenous governments to establish a Federation to coordinate the protection and restoration of their community forests within the Umiam sub-watershed. The Khasi Hills initiative represents a unique

locally-driven response to forest pressures that utilizes innovative financing mechanisms including payments for ecological services (PES) such as the sale of REDD carbon offset credits.

In preparing for the project in 2012 community leaders held over 70 village-level meetings with the 62 participating Federation communities to explain and discuss the proposed project. Under the Federation, a project office was created with a coordinator, bookkeeper, and secretary. In subsequent months, a project field team with 18 community facilitators was established, each responsible for one of the 18 micro-watersheds in the project area. The facilitators are local community members who are selected to coordinate resource management planning, identify degraded forests areas for restoration through closure and enrichment planting, and monitor changes in forest cover. In addition, 62 youth volunteers were selected, one from each village, to assist the facilitators with awareness raising, fire control, and monitoring forest conditions, biodiversity and other project components. During the first year planning phase, a grant of $150,000 from the United Kingdom's Waterloo Foundation supported the project design, after which funding to support the project has been generated through carbon offset sales and revenue from PES agreements with international organizations.

The Umiam sub-watershed that defines the 27,000 hectare project area is situated at an elevation that varies from 150 m to 1961 m above the mean sea level. The plateau is highly dissected where the steeply-sloped Umiam River valley drains into the Bangladesh plain to the south. The project area encompasses the Umiam River valley which is surrounded by rolling upland topography intersected by rivers and rounded hills of soft rock. The Umiam River is one of the state's major rivers and an important source of water for the state's capital, Shillong. The project team has worked with the indigenous governments to identify a long term management plan for the Umiam sub-watershed which includes community conservation forests and a wildlife corridor along the steep banks of the Umiam River gorge, with sacred groves and community forests protected and gradually linked to the larger forest area within the upper watershed. (see Figure 1).

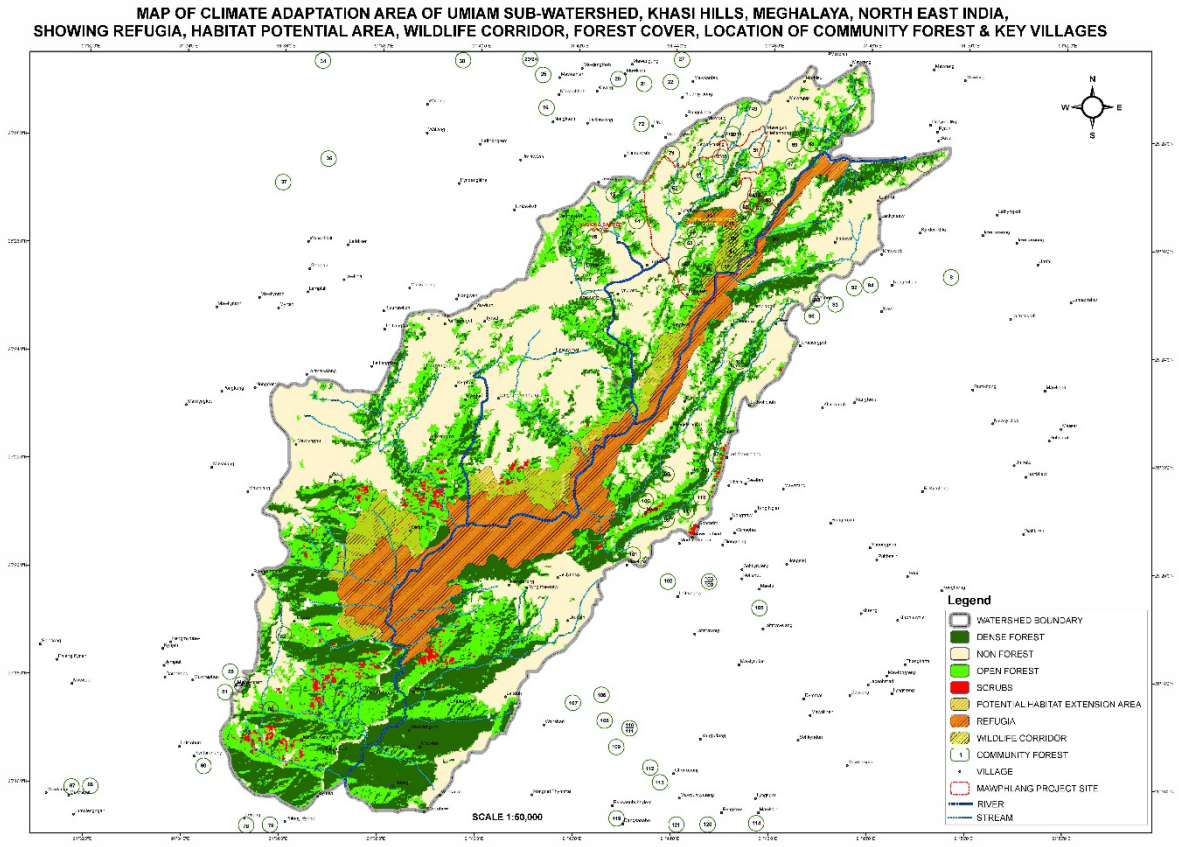

Figure 1. Khasi Hills Community REDD Project Area.

The REDD project design built upon on a four-year demonstration pilot project (2005–2009) initiated by CFI that explored the effectiveness of forest protection and PES mechanisms operating in two communities in reversing forest loss and improving livelihoods. This pilot project generated interest among neighboring communities and indigenous governments, leading to the creation of the federation and commitment to implement conservation and restoration activities. Since the participating communities owned the forest land, they did not need to formally coordinate or seek the approval of local or national governments, though both were informed. This avoided potential delays in seeking inputs on project design and approvals for certification and marketing transactions. Finally, the Federation received both technical and financial support for six years from CFI for the design, monitoring, reporting, and verification (MRV), certification and marketing aspects of the project. From the beginning, there was an agreement that the Federation would take full responsibility for the project by the end of 2014.

The project established a number of new village institutions including the Federation to coordinate resource management and local working committees (LWC) at the micro-watershed level. The new institutions are developing capacity to use scientific forest monitoring systems, including GPS devices, remotely sensed data, and field-based forest measurement conducted by community members. This initiative is India's first PES/REDD project to be certified under the international Plan Vivo standard. Each Plan Vivo certificate that the project generates represents the long-term sequestration or avoided emission of one ton CO_2, plus additional livelihood and ecosystem benefits. For additional information, please see the Project Design Document [12].

Under the REDD project framework, the Federation is implementing a 30-year climate adaptation strategy for their upper watershed. The project is designed to establish an initial 10-year income stream to support the Federation, which could be further extended. Based on initial projections of the impact of community-based activities to avoid deforestation and forest degradation (avoided deforestation), as well as through forest restoration (sequestration), approximately 20,000 tCO_2 of CO_2 emission reduction offset credits are being generated each year, yielding a potential income of USD 100,000 annually to finance the project. Credits come from avoided deforestation and sequestration including the 9270 ha of dense forest under REDD project conservation and an additional 5947 ha of open forests that is being regenerated.

The Khasi Hills Community REDD Project is still at an early stage having been certified under Plan Vivo (Edinburgh, UK) standards in March 2013. In June 2013, 21,805 tCO_2 emission certificates were issued in the Markit Registry. The Markit Registry acts as a clearing house for project carbon allowing credits to be transferred or retired by buyers. Three carbon brokers, including U and We/Zero Mission (Stockholm), C-Level (London), and COTAP (San Francisco) entered into agreements to market the Federation's carbon credits. From May 2013 to October 2015 the brokers were able to sell 26,116 tons of CO_2, valued at $140,439.

In addition, in 2015 the Federation signed a contract with WeForest, a Belgian NGO, to reforest 500 hectares of degraded land for approximately $83,000, with an additional $166,000 scheduled for 2016 when 1000 additional hectares are taken up. This represents the first phase of a ten-year agreement to regenerate 5000 hectares of degraded land. Under the WeForest contract, each micro-watershed committee identifies degraded open forest areas with 10 to 40 percent forest cover to regenerate. The LWC, together with local villages, are responsible for protecting the area from forest fire and closing it to grazing and fuelwood collection. Natural seedling and coppice growth is encouraged through thinning, weeding, and multiple-shoot cutting. Village-based nurseries provide seedlings for enrichment planting in gaps, while volunteer trees that are generated through seeds and coppice growth are protected and provide much of the regenerative biotic material. The reforestation agreement with WeForest requires the use of native species. The reforestation areas are managed by the village responsible for the forest, with coordination from the LWC and the Federation.

3. Data and Methods

In order to address the four key research questions referred to in the introduction, various methodological tools were incorporated in the study. The questions are: (1) Can indigenous groups and their institutions arrest or slow down processes of deforestation, in a context characterized by rapid change? (2) Can a PES scheme under REDD serve as a catalyst in context like the one described, enabling indigenous groups to conserve and benefit from their forests? (3) What constraints put at risk the successful and sustainable involvement of these indigenous groups in the conservation of their forests? and, (4) What conditions contribute to the creation of an enabling environment for the successful implementation of community REDD schemes?

3.1. Assessing Community Capacity to Arrest Deforestation

The primary methodology used to monitor changes in vegetative cover is based on the analysis of a time series of satellite images of the project area. SPOT images from 2006 to 2010 were used to set the baseline rate of deforestation at 2.8 percent per annum. A follow-up satellite image analysis will be done in 2016 to assess changes in forest cover. The project's carbon measurement methodology is described in the technical specifications for the project [13], and estimates that the rate of forest loss will be reduced by 50 percent (*i.e.*, to 1.1 percent) over the first five years of the project and by 75 percent (*i.e.*, 0.55) over the second five years. By 2025, it is projected that forest cover will stabilize and begin to expand as open forests recover. Key variables include the area of dense forest with a canopy closure of 40 percent changed to open forest (less than 40% forest covers) and to non-forest. The second parameter will be the rate of recovery of the degraded open forests which transitions into the dense forest category. In addition to forest cover changes within the project area, the researcher also compares the project rate to the rate of the Khasi Hills District. It is hypothesized that community forest conservation activities and management capacity within the project area are more effective in slowing forest loss as compared to neighbouring communities within the district.

In addition to the analysis of remotely sensed data that monitors forest cover, the project also conducts annual field-level inventories of 60 forest plots (10 m $\times$ 10 m) to assess changes in biomass and carbon stock levels. The measurements are conducted at the end of each calendar year. The forest plot sample includes 20 dense forest plots, 20 open forest plots, and 20 plots under Assisted Natural Regeneration (ANR). The data is analyzed each year to assess changes in biomass. Data collected includes diameter at breast height (dbh) and species type for all trees over one meter in height. The data is collected by the facilitators and youth volunteers, under the direction of a forestry researcher with a doctorate from the Dehra Dun Institute of Forestry.

Since the longitudinal methods described above require a minimum of five years elapsed project time to reveal meaningful changes in forest cover or stocking levels, the project also monitors ongoing activity and event indicators to capture the impact of community mitigation measures. In designing the project strategy community leaders and members identified a number of drivers of deforestation and mitigation measures including: controlling forest fires, closing forests to grazing, closing some forests to fuelwood collection while they regenerate, limiting the conversion of forest lands to quarries and for agriculture, and reducing charcoal making. For each driver indicators were identified that could reflect changes in behavior and actions that would help mitigate forces contributing to forest loss. Facilitators from each of the 18 micro-watersheds are responsible for collecting data on the indicator and reporting the findings to the monitoring officer. The mitigation indicator report provides information on the impact of fire, areas closed to grazing, length of fire lines created, number of quarries operating, and number of households with fuel-efficient stoves. This, in turn, provides an overview of community capacity to limit forest loss and carbon emissions.

3.2. REDD as a Catalyst for Community Action

To assess the extent to which the REDD project has been a catalyst for community conservation and livelihood activities, the project relies on a number of activity indicators. Catalyst indicators measure the number of community-based activities and events that are outcomes of the REDD project. These include those meetings and activities occurring within the newly created organizations (Federation, Local Working Committees, Self-Help Groups, *etc.*), as well as among traditional institutions (*hima*, village, *etc*.). The project monitors the number of forest management meetings at each level to assess participation rates and decisions taken at each meeting.

3.3. Identifying Constraints Faced in Implementing a Community REDD Project

This study utilized participant observation as a primary research tool in identifying constraints encountered during the planning and implementation of the project. The Federation and project team participated in identifying difficulties that they have faced since the initiation of the design phase. The project team also produces quarterly and annual reports for the certifier that provide an ongoing record of the problems encountered by the team and the participating communities in implementing the REDD project. The research process involved analyzing the quarterly reports and in-depth discussions with the project team leader to better understand the difficulties emerging as implementation progresses. Two broad categories of constraints emerged through the analysis including those that were internal to the project, and those that were external (Government of India policies, certification standards and procedures, financing, *etc.*).

3.4. Identifying Conditions that Enable the Success of a Community REDD Project

Through the use of participant observation methods that involve documenting the process of project development, the researcher has been able to identify some of the conditions which have allowed the project to move forward. Aside from the researcher's own view regarding those conditions, discussions with the project team has helped identify some of the conditions that they feel have allowed them to successfully implement project activities.

4. Results and Discussion

REDD projects typically possess long time frames of 30 years or more; consequently learning from the first few years reflect issues that emerge during the design and early initiation of the project. Major environmental and socio-economic impacts can only be assessed after the project has been running for an extended period of time. Nonetheless, it is useful to reflect on the initial experiences of the project as the design, certification, and early market experiences, as well as community mobilization has already taken place. The findings for each research question are discussed in detail below.

4.1. Community Capacity to Slow and Arrest Deforestation

The best indicator of community capacity to slow deforestation is an analysis of forest cover change reflected in satellite imagery which is scheduled for 2016 and 2021. Annual forest plot inventory data does show substantial increases in biomass levels of project forests in all inventory plot categories including dense forests with more than 40% canopy closure, open forests with 10 to 40% canopy closure, and open forests that are being actively reforested. Table 1 below provides data from the forest plot inventories over the first three years of the project. Based on the annual forest inventory conducted by the Federation team and reported in the Annual Report for 2014, the carbon stocks range from around 60 tC/ha to 150 tC/ha, with an average of 129 tC/ha in 2014 for dense forests. The data indicate that in the sample areas biomass is increasing and carbon is being sequestered. It is envisaged that the open forests will gradually transition towards more mature into dense forests over the next 30 to 50 years. Based on sample plots, the average open forest area has

3.75 tC/ha, reflecting a high level of degradation, while the ANR sites average 11.97 tC/ha as they have somewhat greater biotic material than the average "open" forest. According to the 10 ANR plots sampled in November 2014, the increase was 2.7 tC/ha year on year, *versus* 0.28 tC/ha for areas which were not involved in the ANR activities. This substantially higher rate of sequestration may be due to a number of factors including: better fire control, thinning and weeding, enrichment planting, as well as better soil and moisture conditions.

In addition to forest plot inventory data, the project relies on a number of indicators reflecting the extent of community involvement, awareness, and the extent of mitigation and reforestation activities. These indicators are used to illuminate community capacity to slow forest loss and reflect the impact of mitigation activities that are designed to control drivers of deforestation: increased fire line construction, reducing amount of fuelwood collection, and closure of forest restoration area.

Table 1. Changes in Carbon Stocks by Forest Type—2012–2014.

Forest Type	2012 tC/ha	2013 tC/ha	2014 tC/ha
Dense	113	120	129
Open	3.39	3.47	3.75
Open with ANR	-	9.27	11.97

4.1.1. Increased Fire Line Construction

Forest fires not only drive the loss of forest cover, but also inhibit natural regeneration processes by suppressing new growth. Under the project, each micro-watershed group (LWC) is responsible for preparing and maintaining fire lines to control forest fires in their areas. Village-level community facilitators hired by the Federation are responsible for coordinating community efforts to control forest fires when they break-out. During 2014, 15.8 kilometers of fire lines were prepared to limit the extent of annual forest burns. As a result of community actions, average annual forest fire area fell from 82.8 ha during the 2010–2012 period, to 62.3 ha from 2013 to 2015. It is apparent that community efforts to control fire have been moderately successful. The extent and impact of human caused fires have been reduced by 25% after the Federation campaign to raise awareness and encourage the indigenous governments to update and implement their forest regulations including fines. Nonetheless, forest fires continue to occur due to causes beyond the community, such as lightning strikes, malfunction of electrical transformers and the disposal of cigarettes by travelers passing through the project area. Remote areas with low populations have the most difficulty controlling fire.

When fires do occur, community response capacity has been improving each year with the re-vitalization of the Khasi tradition of community clearing fire lines. Community members watch for fire outbreaks which allow fires to be extinguished more quickly, before they transform into large burns. During the 2015 dry season (January to May), virtually no forest was damaged due to fire. Prior to the initiation of the project, several hundred hectares would burn each year.

4.1.2. Decreased Fuelwood Collection

Project households are heavily dependent on fuelwood collection, while wealthier families purchase fuelwood for heating and cooking. Very few households have shifted to liquid petroleum gas (LPG/LNG) or kerosene due to cost and distribution problems. Families typically use 20 to 30 kgs per day with heavier use during the cold winter months. Relatively high fuelwood use is, in part, due to large family size of many families in the project area which may have seven or eight members or more. A recent study of a Middle Hill watershed in Nepal, with somewhat similar climate conditions, found that use averaged 683 kgs per year per capita or 13 kgs to 15 kgs per day for families of a similar size as those within the project area, however the study found that Nepali fuelwood demand could range from 200 to 2000 kg per year per person [14]. In the project area,

high fuelwood use maybe a result of the relatively cold winter at 5000 ft elevation and the practice of cooking pig fodder. In areas like the Khasi Hills, where fuelwood consumption has outstripped forest growth, the process of forest degradation accelerates as demands increase from an expanding population. Cutting of green wood has resulted in biomass loss and undermined natural growth of forests and has been a major driver of forest degradation. In response, the Federation has instituted a range of activities to address the problem: subsidizing fuel efficient stoves and reducing the cooking of pig fodder.

After testing a variety of fuel efficient stoves, the Federation began promoting a model that can be constructed on site with locally available cement, rebar, and metal pipe. The stoves cost approximately US$20 to build by local youth trained by the Federation. In the past the Federation has paid for all costs related to the stoves, though they may ask the homeowner to pay Rs. 200, or approximately 10 percent of the costs as a contribution for the material. In 2014, the Federation installed 20 stoves were installed, two in each *hima*. In 2015, the Federation plans to install an additional eight per *hima*, with a total of 100 stoves operating reducing fuelwood consumption by 30% to 50% in households with the new stoves. This will result in an annual fuelwood reduction of approximately 400 metric tons per year. In addition, the new stoves are equipped with metal smokestacks to reduce air pollution in family homes. By 2020, the project hopes to have fuel efficient wood stoves in 50% of the households raising the annual reduction in firewood consumption to 7500 tons per year.

An estimated 80% of Khasi households raise pigs to generate household income. The project encourages pig raising as an alternative livelihood strategy compared to low-value cows and goats that suppress regeneration due to forest grazing. The project has encouraged these livelihood activities providing grants to women micro-finance groups (self-help groups) to catalyze investments in animal husbandry. The project found that many women felt it necessary to cook the pig fodder, an unnecessary task that substantially contributed to increased fuelwood consumption in the project area. The cooking of pig food was traditionally practiced by Khasi women to break down kitchen wastes and grains. The Indian Council for Agricultural Research told project staff that this was unnecessary for pig digestion. Homestead Organics, an agricultural extension organization in the United States reports that in the United States "traditionally hog food was cooked and fed as a wet mash. Now, rather than cooking pig food, many small scale hog farmers pour water, sometimes boiling water, milk or whey over the food and let it sit. This makes the food more digestible and more palatable for the pigs." An awareness campaign is ongoing in the project area to discourage the practice of cooking pig fodder. This initiative is gradually changing behavior with a 40% to 50% reduction in households cooking pig fodder and a similar decline in wood use for this purpose. While there is still resistance from older, traditional women who believe in cooking pig fodder, the practices is gradually declining as the extension program is being implemented.

4.1.3. Closure of Forest Restoration Areas

The project area has 5280 hectares of degraded, open forest lands with 10 percent to 40 percent canopy closure. While some open forest is highly eroded and devoid of significant biomass, there are also large tracts of land with tree seedlings and saplings, shrubs, and grasses that are not growing into dense forests due to use pressures. Given high rainfall levels prevalent in the Khasi Hills, these disturbed forest ecosystems can experience rapid regeneration if forest fires, tree and shrub hacking for fuelwood, and grazing pressures are removed. The Federation is accomplishing this sequentially, by working with neighboring communities to identify and close selected, high regeneration potential, forests through "social fencing" involving fire control, informal patrolling, monitoring, and carrying out thinning, culturing, and enrichment planting. The project closed 16 blocks totaling 500.5 hectares in 2014, with an additional 500 hectares in 20 blocks in 2015. The blocks will be closed to use for ten years after inclusion in the forest restoration program. After which it may be reopened under

a sustainable use management plan. The project seeks to restore 5000 hectares of degraded forests by 2025.

While extensive empirical data on changes in deforestation levels in the project area is not yet available, activity indicators suggest that the community REDD project has made progress in controlling major drivers of deforestation. Dense forest areas appear better protected from encroachment and damage, while open forest show early signs of regeneration. While forest plot inventory data is based on a relatively small sample size, over the past four years all categories show increases in carbon stocks. Given the ambitious size and scope of this community conservation initiative and the constraints it faces, which are described below, it will take time for environmental and socio-economic impacts of the project to be broadly experienced.

4.2. REDD as a Catalyst for Community Action

Team discussions, project reports, meeting minutes and participation records all indicate that the design and development of the Khasi Hills Community REDD Project catalyzed a series of dialogues, actions, and consensual decisions that are beginning to improve forest governance, development processes, and the environment. These include the creation of new institutions to assist traditional government with resource management and development tasks, raising community awareness regarding forest conservation needs, building community consensus, and creating a process for community-based resource management planning and monitoring. Some key changes resulting from the project include: creation of new community organization development, awareness raising, building community consensus, and community-based planning.

The formation of a Federation by ten neighboring indigenous governments (*hima*) in order to coordinate forest management plans and activities was a historic event, creating a permanent institutional framework for inter-village discourse focused on resolving natural resource management problems. The establishment of the Federation also raised the visibility of indigenous government leaders and councils by state-level government officials, helping direct government projects to priority development needs and capacity building activities. Resource mapping and planning created dialogue among community members about the need for conservation and restoration. The creation of Local Working Committees (LWC) of community members at the micro-watershed level support to local clusters of three to five villages address forest management issues. This includes developing long term resource management plans and implementing activities such as forest monitoring, fire control, fuelwood production, *etc.* The LWC also provides the project with a channel to support to women-led micro-finance groups in the forms of tree nursery contracts, grants for alternative livelihood activities such as piggeries, eco-tourism businesses, *etc.*

One of the striking results of the REDD project has been to catalyse forest conservation and livelihood generating activities throughout the project area. Given the relatively large size of the project (over 27,000 hectares) involving 62 often isolated villages with 25,000 inhabitants, the initiative has achieved a remarkable level of community mobilization. In 2014, approximately over 150 meetings, field visits, and training programs were conducted by the project team. This was made possible by the engagement of 18 micro-watershed level community facilitators and 62 youth volunteers, guided by the project team and endorsed by the authority of indigenous government leaders (*Lyngdoh*, *Siem*, *Sardars* and their ministers). Further, the organization of the indigenous communities has drawn the interest and support of Government of India agencies, including the Indian Council for Agricultural research which supports agricultural and animal husbandry projects.

The design and implementation of the REDD project required the communities to work with project developers to identify forest related problems, discuss possible solutions and project interventions, and develop systems to assess change and monitor impacts. This has involved scores of meetings over several years, including those at the village, *hima*, and Federation level. Through this process a vision and plan for community forests has gradually emerged that is shared by a growing number of community members. The establishment of a Federation to coordinate the actions of

the 10 member *hima* governments and to raise funds for improved forest management represents outcomes based on a broad consensus.

Through the planning process the communities agreed to create a long term management plan for their sacred groves and community forests at a landscape level within the Umiam sub-watershed. The plan will gradually restore and link patches of degraded open forests to connect to the dense forest areas that are located along the steep walls of the Umiam River gorge. This wildlife corridor is being protected and managed by the Federation and includes the historic David Scott trail. The trail winds through the project area for 16 kilometers, part of an early 19th century stone pathway that linked Bangladesh to Assam. The project has registered this area as an Indigenous Community Conserved Area (ICCA) with the United Nations.

4.3. Constraints Faced in Implementing a Community REDD Project

Community REDD projects face a diverse and multi-level set of constraints as they move from design into implementation. In the case of the Khasi Hills project, such barriers repeatedly challenged the project team. Some problems are contextually rooted such as rapid population growth that places growing pressure on natural resource management systems that attempt to slow deforestation and poverty that increase dependence on the utilization and exploitation of natural resources. Other barriers are found within the community itself such as disempowered traditional institutions with limited capacity and technical skills. External constraints may include problems securing financing for project development, government development projects that are often poorly implemented and involve corrupt practices, the complexities of international REDD certification systems, and the ongoing weakness in international carbon markets. These constraints are discussed below.

4.3.1. Population Growth

The vast majority of the 25,000 people in the project area are heavily dependent on local forests and farm lands for their incomes, food crops, and fuelwood. Population growth is rapid with many Khasi families having five or six children. While Khasi communities have a high literacy rate and emphasize the education of their children, off-farm employment opportunities are limited, even for those with high school education or college degrees. Given small farm size and scarce off-farm job opportunities, resource pressures are increasing requiring careful management of farms, forests, and water sources to ensure sustainable productivity.

4.3.2. Limitations of Traditional Management Systems

While indigenous community institutions have rules and regulations governing resource use, these are often unwritten and may not respond in an adequate fashion to the growing pressures on forests, land, and water. Typically, such traditional forest-use regulations were established generations ago and continue to be accepted social norms that guide behaviour to varying degrees. Nonetheless, as demands on the forest have grown through population growth and market expansion, and as outside cultural communities have moved into the area, systems for monitoring and enforcing these regulations often lack the technical and financial support necessary for effective implementation. Technical capacities to engage government, civil society organizations, and markets are often limited and require development.

4.3.3. Financing

A major external problem for the Khasi Hills Community REDD project was finding ways to finance the design, development, certification, and validation of the project while waiting for carbon offset certificates to be issued and sold. Start-up costs were substantial in preparing the project design document, initiating planning activities, and beginning mitigation actions. In India there is no grant funding agency or national financing mechanisms to support community REDD initiatives. Once the project began to receive some limited funding from carbon sales, even this source of support was

uncertain due to problems finding buyers for project carbon. With assistance from CFI, the Federation was able to receive a 12 month grant of 100,000 pounds from the Waterloo Foundation to design the project and pay for certification costs, however the project struggled with limited funding during the first and second year. The project continues to suffer delays in receiving funds from carbon sales outside India, as the Government of India (GOI) requires NGOs to go through a complex approval process under the Foreign Contributions Regulation Act (FCRA). As a result the GOI has halted Federation access to revenues from carbon sales until FCRA approval is granted. This is precisely the type of national government policy that can effectively block community attempts to participate in forest carbon projects.

4.3.4. Forest Carbon Project Complexities

The development of a community REDD+ is a complex process requiring knowledge and multiple skill sets that few organizations possess. Few indigenous communities and NGOs are familiar with the concepts and methods required to develop a Project Design Document (PDD) much of which involves establishing carbon stock baseline estimates, estimating the impact of mitigation activities, and developing a monitoring system. In addition, the project must seek certification and validation, and implement the monitoring and reporting systems that lead to credit issuance and marketing of carbon offsets. No carbon sales can take place until the project has been certified, completed the first year of activities and submitted their annual report. Partnerships and collaborative relationships are an essential component of most successful projects.

4.3.5. Carbon Markets

After the 2012 carbon credits were issued the project faced difficulties finding buyers and faced an initial lack of funding for project activities. Forest carbon offset markets have fared poorly over the past few years as prices and demand for the offsets has been week. Yet, as the project became better known in the voluntary carbon markets, particularly in Europe, sales began to pick up. By 2015, approximately 54% of the carbon offset certificates generated by the project in 2012, 2013, and 2014 were sold. This generated $140,439 in revenue for the project which is being used to support mitigation activities such as fire control and fuel efficient stove distribution, finance management and monitoring, and provide support for community development grants. The Khasi Hills project is limited to voluntary emission reduction (VER) markets such as companies with Corporate Social Responsibility (CSR) programs, rather than to those who require certified emission reduction (CER) certificates.

4.4. Conditions that Enable the Success of a Community REDD Project

A number of conditions allowed the Khasi Hills Community REDD Project to be successfully designed, developed and certified in a relatively short period of time. They included: tenurial rights, a charismatic and committed community leadership, creation of a federation of indigenous governments, traditional forest management systems, and the presence of supportive international organizations.

4.4.1. Tenurial Rights

According to the Sixth Schedule of the Indian Constitution, the state of Meghalaya has a dual system of administration that includes the modern bureaucratic structure common to other Indian states and the traditional (customary) systems found within the state. Khasi villages retain considerable autonomy over their natural resources and traditional organisations are responsible for the management of forests and other lands under their collective control. As the *hima* hold clear rights over the majority of the forests in the project area, their Federation was able to negotiate carbon sales agreements directly without requiring approve from state or national government officials, expediting the implementation of the project.

4.4.2. Charismatic and Committed Leadership

The Secretary of the Indigenous Government (Mawphlang *hima*) took the lead from the beginning in initiating both internal and external dialogues regarding the need for a forest conservation strategy. He had been a student leader in his youth and was actively involved in forest conservation when the project was initiated. He has evolved into the role of project director and the relative success of the project is, in part, enabled by his vision, ability to mobilize communities and work through indigenous institutions, and inspire his staff. His capacity to interface with modern institutions and systems involved in REDD project management is unusual, but essential for this type of project.

4.4.3. Creation of a Federation of Indigenous Governments

The ability of *hima* leaders to agree to form a Federation to coordinate and support management of community forests in the watershed was a key step in the development of the REDD project. The Federation provided a mechanism for financial and technical support that enhanced the effectiveness of conservation and restoration activities. In the case of the Federation, indigenous communities also gained greater visibility and developed stronger linkages with state development activities as a result of the creation of an apex body and project team that facilitated communications. The establishment of the Federation was enabled by the homogeneity of the Khasi community and the traditional network of communications that existed prior to the project.

4.4.4. Building on Traditional Forest Management Systems

In the case of the Khasi Hills, traditional systems of forest management were present and somewhat effective in controlling drivers of degradation and deforestation. Yet, local pressures on forests have been increasing for decades driven by rapid population growth, while new external market pressures are entering into the area. Indigenous governments (*hima*) were increasingly leasing community lands to commercial quarrying and mining operations in order to generate funds, though the income was modest the environmental impacts on the forest were substantial. To control deforestation the communities recognized that indigenous management systems needed to be updated to address the underlying causes of deforestation and forest degradation. The REDD project required the establishment of baseline assessments and the monitoring of changes in the environment. The project also required the development of long term conservation and restoration management plans, with clear implementation duties allocated to traditional government institutions, as well as to newly created micro-watershed management groups (Local Working Committees). The process of designing this REDD project catalyzed a broader dialogue among the participating communities regarding the environmental problems in the area and their solutions. As a consequence, the evolving management system was founded on Khasi forest conservation and sustainable use values and institutions, with new planning, monitoring, and reporting systems added and coordinated through the federation.

4.4.5. Role of Supportive International Organizations

A number of international organizations have provided technical support to the Federation to support the development of the community carbo project. Community Forestry International (CFI) began working with the communities in 2005, helping community leaders to identify local drivers of deforestation and effective mitigation measures. CFI was instrumental in helping design measurement and monitoring systems to assess baseline carbon stocks and model mitigation impacts, as well as assess project impact, supported by BioClimate, an Edinburg-based NGO. Plan Vivo provided a community-friendly system of standards and a system to undertake project certification. Markit Registry holds the carbon offset certificates, while organizations like Zero Mission (Stockholm), C-Level (London), and COTAP (Oakland, California) have all facilitated the

sale of carbon credits. More recently, the Federation has entered into reforestation contracts with We Forest, a Belgian-based NGO that provides payments based on each tree grown in restoration sites. These international organizations not only provide a financing support network, but provide additional credibility to this community-based initiative.

From the outset of the project, it was the goal of CFI to transfer all management and reporting responsibilities to the Federation by 2014. This timeframe was extended through 2015 to allow more time for the Federation to develop the technical skills to achieve this goal. While the Federation continues to receive some external support from CFI staff, it is now performing virtually all management functions and maintains direct contacts with Plan Vivo and marketing partners. To secure additional technical support the Federation has formed a Technical Advisory Committee, comprised primarily of local forestry, animal husbandry, and GIS experts and researchers.

5. Conclusions

One of the larger studies of community forest management and REDD+ was conducted under the World Bank funded PROFOR initiative and published in 2014 [15]. It examined REDD+ project experiences from Nepal, Tanzania, and Bolivia, three countries with active CFM groups and networks. The survey found that many REDD+ pilots are already in place and have strong compatibility with CFM goals and strategies, however few projects are actually certified and trading carbon on international markets. Consequently, it is difficult to compare their impact with that of the Khasi Hills Community REDD+ Project which has several years of experience with certification, MRV activities, and marketing and selling carbon in global markets. Rather most other CFM REDD+ projects studied have largely been funded by donor agencies as part of REDD+ Readiness initiatives and the study's authors raise concerns that when donor funding ends, the continuity of financing remains a question. In some cases, like Nepal's Forest Carbon Trust Fund, the designers envision international payments being made to the trust fund, which would then be allocated to CFM groups and network [15]. The PROFOR study notes that many projects are based on participation and need to be better linked to performance. The study also emphasizes the value in the creation of higher-level community institutions and networks to overcome barriers to vertical coordination with REDD+. The creation of a watershed federation has been an important component of the Khasi Hills Community REDD+ Project capacity to unite communities to facilitate interaction with certifiers, carbon brokers, and buyers.

As the PROFOR report stresses, REDD+ can benefit from strong linkages to CFM initiatives around the world. Aside from the strong tradition of CFM in the Khasi Hills, such systems are found throughout the region. A recent study from nearby Nagaland state in northeast India found 407 community conservation areas (CCAs) covering much of the state's forest land [16]. Inadequate livelihoods were reported to be among the biggest challenges to forest conservation according to 81% of the communities surveyed, with 59% reporting threats from organized mafia (including timber, wild meat). Fifty-eight percent of the village councils reported that the lack of finances for resource management and livelihoods left them vulnerable to outside actors who wished to exploit the conservation area.

A recent survey of community forest carbon projects by Lawlor *et al.* [17] found that such activities produced jobs and generated cash transfers. This is consistent with the experience of the Khasi Hills Community REDD Project. The survey authors, however, agreed with other policy experts that the future of REDD+ finance should be linked to national climate adaptation objectives [18,19]. The Khasi Hills project has succeeded in part due to its independence from national schemes and its ability to secure PES funding from non-government sources. The project is delivering benefits to the communities and achieving REDD+ goals despite fund transfer barriers imposed by national bureaucracies. Through successive administrations, since REDD+ was launched in 2007, the Government of India has yet to design a supportive policy framework for community-based REDD

projects. What appears to be working in the Khasi Hills is a partnership between communities, local NGOs, international organizations, and carbon buyers for private sector firms.

The uniting of the communities within a federation was an essential step in the development of a promising REDD project. It allowed the project to reach an economy of scale where it could be financially viable and a framework for coordinating and integrating action across the watershed. Relying on local, dynamic leaders, and utilizing external support to build technical capacities to clear the certification and marketing hurdles, established a functional partnership. The project is currently evolving under the local community-based management team that is in daily contact by Skype and email with international certifiers and NGOs, carbon brokers, and carbon buyers. By working with the Plan Vivo system, the project identified a community-oriented set of project standards that better reflected the goals and capacities of the Khasi cultural communities. A growing number of buyers have been attracted by the opportunity to invest in a multi-benefit project that generates carbon offsets as well as producing other environmental and socio-economic services. For that reason, The project has been selling its carbon prices for \$5 to \$ 9 per tCO_2, while those from industrial REDD projects plummeted in 2014 period to as low as \$1 per tCO_2.

Perhaps equally important, the process of going through the project development cycle has helped unite neighboring Khasi communities and build their capacity to collectively address both environmental and development issues, strengthening and empowering their traditional institutions in the process. The project helped build new skills in planning, monitoring, and reporting systems, as well as injecting financial resources over which the Federation has direct control, unlike government and donor schemes where decision making and management is largely in the hands of departmental staff.

The historic transition in forest governance systems in Asia, which has been characterized by the emergence of national community forestry legal frameworks and laws in India, Nepal, Vietnam, Thailand, Indonesia, and the Philippines, has to varying degrees strengthened the rights of communities to their forests. Experience from the Khasi Hills suggests that recognizing community forest rights alone may not result in improved forest management or increased livelihoods. Since the colonial period and up to the present day, Khasi communities have held clear rights to their ancestral forest lands, yet they have seen a steady loss of forest cover in past decades. Until the onset of the project, they lacked support to improve and modernize their management systems including building institutional capacity, developing long term management plans, formulating updated use rules and regulations, and establishing effective monitoring systems to track changes in forest conditions, hydrological functions, and biodiversity.

The development of a Federation and the preparation of a REDD project required the participating communities to re-visit their traditional management practices and add these new components in order to reverse deforestation and degradation trends that had been impacting their forests for decades. As a result of the project, a modernized, community-based management system is beginning to emerge that builds on and supports the traditional institutions (*hima*). Further, the project has resulted in new sources of financial resources for forest management including restoration of degraded forests, fire control, monitoring, as well as forest related livelihood activities

As the global and national rules governing REDD are developed, it is important that emerging field experiences, like those from the Khasi Hills, inform the thinking of policy makers. If REDD is to play a substantial role in reducing GHG emissions from forests, the policy environment must be designed to enable the meaningful involvement of forest-dependent communities. Early REDD project experiences can identify constraints and opportunities that can guide the formulation of an enabling environment for project development and the combination of conditions that may favor widespread replication. Community REDD project learning can inform global climate change initiatives empowered under the UN Framework Convention on Climate Change (UNFCCC). Unfortunately, the potential synergy generated by linking community forestry activities to REDD projects has not taken place in Asia. This has, in part, been due to the UNFCCC emphasis on

supporting an unending series of international and national REDD policy dialogues, rather than creating an enabling environment for local community-based forest carbon projects through the provision of technical and financial support, as well as encouraging the development of markets specifically for community forest carbon. This has slowed the development of community-oriented project standards, MRV systems and certification mechanisms, as well as an efficient carbon market for environmental services provided by forest communities.

Community-based REDD projects have the potential to become the foundation for jurisdictional and national REDD strategies. Forest dependent communities are often best able to control local drivers of deforestation and forest degradation. They are strategically positioned and possess the local knowledge needed to mitigate common threats such as illegal logging, forest fire, small holder agricultural expansion, and poaching, while possessing labor and resources to restore degraded forests and protect and conserve local forests. Yet they cannot achieve these goals without an enabling framework created by national and local governments. At the very least national governments need to ensure tenure security, while controlling more powerful drivers of deforestation such as timber, estate crops, and mining leases. To further support the development of community REDD initiatives, governments need to explore innovative mechanisms such as the creation of a national fund to purchase community forest carbon, financed by placing environmental taxes on corporations.

The author concludes that community REDD project design and certification processes must be simplified and be accompanied with more accessible sources of flexible financing. Some of the emerging international carbon standards have set the measurement bar so high that only project design teams with access to sophisticated carbon measurement and modeling methodologies and data analysis capabilities can hope to attain certification. Forest monitoring tasks could be transferred to third party organizations with the necessary technical expertise and data base. Costs for designing and certifying projects are prohibitively expensive for most forest dependent communities and could be reduced by building in-country technical capacity. There is an urgent need to draw learning from community REDD and other payment for environmental services projects. With a growing body of "proof of concept" examples like that from the Khasi Hills, policy makers, planners, and private sector investors will be both better informed regarding the keys to creating an enabling project environment and encouraged to build a global REDD strategy from the bottom-up.

While addressing poverty issues may not be a core concept in market-oriented REDD project development, it may be key to achieving many REDD carbon objectives when the threats to forests can only be secured through a meaningful engagement of local communities. For decades, the international environmental discourse has recognized the linkages between forest conservation and addressing poverty problems. As one analyst notes:

"Following the Brundtland Report and the Rio 1992 conference, tropical conservation gradually headed in a more people oriented direction. The trend reflected the conventional wisdom that alleviating poverty was the only way to conserve and protect the environment [20]."

If a global REDD initiative is to succeed, the rules and programs emerging from UNFCCC COP 21 will need to provide an enabling policy and procedural framework, and financing mechanisms that encourages community forestry initiatives in diverse contexts around the world. Incentives for achieving REDD goals must be shared with forest dependent communities that are mitigating local drivers of deforestation and achieving primary REDD program goals, rather than rewarding government agencies for attending policy dialogues. REDD presents potential opportunities and incentives to recognize forest tenure and stewardship rights, both to slow deforestation by clarifying domain claims and also by providing tenure security that will allow forest managers to invest in conservation and restoration. Creating an enabling global environment for community-based forest conservation initiatives is an essential step in stabilizing forest ecosystems and addressing global warming.

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