COLUMBIA UNIVERSITY in partnership with WORLD RESOURCES INSTITUTE

DEVELOPING POLICIES AND LEGAL FRAMEWORKS TO INCENTIVIZE FOREST PROTECTION

Columbia University | MPA in Environmental Science and Policy

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EXECUTIVE SUMMARY

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The Forest Governance Team of the World Resources Institute (WRI) requested that graduate students in Columbia University's Environmental Science and Policy (ESP) MPA program at the School of International and Public Affairs investigate and make recommendations to improve upon forest incentive programs. The WRI Consulting Team, (henceforth referred to as the Team), assessed a broad range of forest programs around the world, and developed a database that tracked the relationship between strong governance measures and successful incentive schemes at the global scale. At the same time, the Team conducted three case studies to examine in greater detail the enabling and limiting factors of forest incentive schemes in three regions of particular interest to WRI: Indonesia, Madagascar, and Mexico. Each case study provided an in-depth analysis of the best practices and limitations that the programs had regarding four governance parameters: participation, land tenure, program design and implementation, and monitoring capacity. This combination of both scope and depth allowed the Team to develop insights into patterns that exist across different programs and regions, as well as underscore the value of understanding local context.

The Team created a set of 20 policy recommendations based on the enabling and limiting factors of forest incentive programs framed within the four overarching forest governance areas. There were three recommendations on land tenure, three on participation, seven on program design and implementation, and seven on monitoring capacity. The recommendations were created to be applied by practitioners, such as government agencies, international and local NGOs, transnational corporations, as well as advisory bodies at multilateral development banks and academic institutions, among others, toward the design of new incentive schemes or the annual review of current schemes.

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LIST OF ACRONYMS

2W1B	Two Worlds - One Bird
CAZ	Corridor Ankeniheny-Zahamena (Ankeniheny-Zahamena Corridor)
CI	Conservation International
COAP	Code des Aires Protégées (Protected Area under the Malagasy protected areas legislation)
COBA	Communauté de Base (Grassroots Communities)
CONAFOR	Comisión Nacional Forestal (Mexican National Forestry Commission)
DGF	Direction Générale des Forêts (General Forest Agency)
ESIA	Environmental and Social Impact Assessment
ESP	Environmental Science and Policy
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GFI	Governance of Forest Initiative
GHG	Greenhouse gas
Ha	Hectares
HKm	Hutan Kamasyarakatan (Indonesian Community Forestry Project)
ICRAF	International Center for Research in Agroforestry
IFAD	International Fund for Agricultural Development
IPSI	International Partnership for the Satoyama Initiative
IUCN	International Union for Conservation of Nature
LMU	Local Management Units
MEF	Ministry of Environment and Forests
MPA	Masters of Public Administration
NFCP	Natural Forest Conservation Program
NGO	Non-Governmental Organization
NTFP	Non-Timber Forest Products
PA	Protected Area
PES	Payment for Ecosystem Services
PSAB	Proyecto de Servicios Ambientales del Bosque (Payments for Biodiversity and Carbon Captures Services program)
PSAH	Pago por Servicios Ambientales Hidrológicos (Payment for Hydrological Services Program)
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RUPES	Reward Upland Poor of Asia for Environment Services
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIFEM	United Nations Development Fund for Women
VCS	Verified Carbon Standard
WRI	World Resources Institute

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LIST OF DEFINITIONS

Adaptive Management | A systematic approach to learning from management outcomes

Case | Projects/Programs included in the database

Case Study | The three programs/projects selected from the database for a broader investigation and deeper analysis

Enabling Factors | Characteristics that propel programs forward and contribute to their success

Limiting Factors | Characteristics that inhibit programs from implementation or lead to failure to achieve objective(s)

Program | The strategy or policy that is being implemented per the vision stated in a scheme (plan)

Examples:

- Madagascar's CAZ Program
- Mexican National PSAH Program

Project | An individual or collaborative enterprise designed to achieve a particular aim

| The actual implementation of a policy

Examples:

- Four incentive projects of Madagascar's CAZ Program
- Forming actual committees
- Madagascar carbon project

Scheme | Large scale systematic plan or arrangement for attaining some particular object or putting a particular idea into effect

| An overarching theory/vision that could become a policy when we are referring to programs (vision)

Examples:

- International Payment for Ecosystem Services schemes
- Carbon trade schemes

Trends | Recurring characteristics across multiple cases in the database (will only be referred to in the database discussion)

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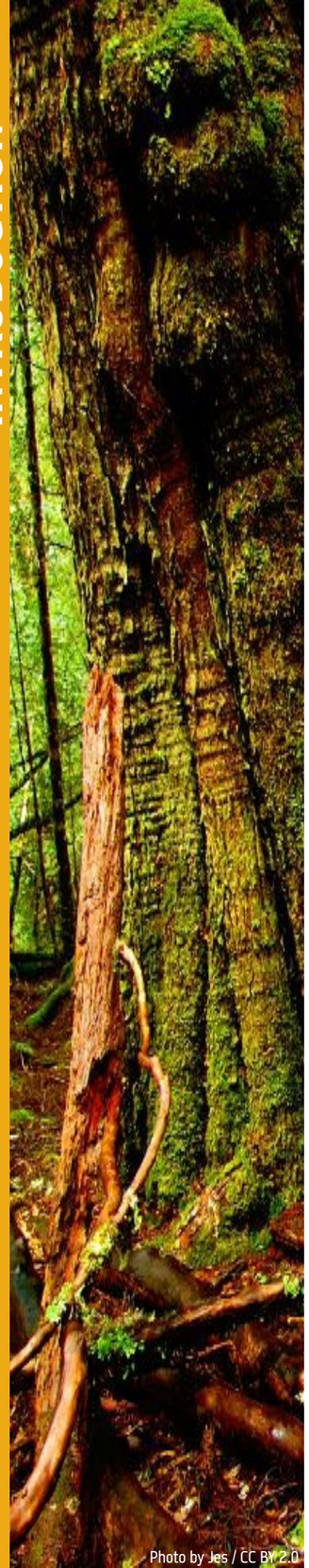
INTRODUCTION



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Over the last two decades, the world has lost over 2 million square kilometers of forest, an area larger than many countries.[1] The World Resource Institute's (WRI) Governance of Forests Initiative works to address the weak governance and insufficient incentives for forest protection that lead to forest loss and diminished biodiversity, which in turn contributes to global climate change and the marginalization of forest dependent communities.

In January 2015, the WRI Consulting Team began work with WRI to research and analyze the strengths and weaknesses of incentive programs for forest protection globally. This project centers on understanding how governance structures and social factors influence forest incentive programs that aim to protect forest and forest-related natural resources and contribute to sustainable development. Specifically, the team examined participatory, transparency, and accountability measures in programs to identify best management practices, and analyzed the influence of project components such as right to property (e.g., strength of land tenure), governmental and nongovernmental involvement, financing, and more. This lens puts people at the heart of the research because understanding the participation of forest communities is integral to better design and implementation of forest incentive programs that are both environmentally and socially beneficial.

Our team was composed of a project manager, a deputy project manager, two database managers, three case study managers, two co-editors, and one presenter. The project progressed through three stages. It: 1) identified incentive programs that support forest conservation and restoration and compiled information on key issues related to forest governance; 2) analyzed key factors identified in the cases; and 3) made policy recommendations for improved design and implementation of future policies and programs.

By assessing a broad range of forest programs around the world, the Team developed a database to track the relationship between strong governance measures and the implementation of best management practices in incentive schemes on a more global scale. At the same time, the Team conducted deep dives into three cases to examine closely how best management practices in programs contributed to ensuring equitable involvement of forest-dependent and marginalized communities, and to what extent they can act as an enabling and limiting factor for the potential success of incentive programs. This combination of both breadth and depth allowed for developing insights into patterns that exist across different programs and regions, as well as underscores the value of understanding local context.

This report encompasses six sections. First, the Methodology section describes the process that the Team used through the four-month project. It elaborates on the development of the database, cases studies, enabling and limiting factors, and policy recommendations. Second, the Database Discussion explores the trends drawn from the team's collective database of 49 cases from three regions: Australia and Asia, the Americas, and Europe and Africa. Third, the Case Study Discussion takes a more comprehensive look at three individual case studies from Indonesia, Mexico, and Madagascar, and includes an analysis of each of the programs' strengths and weaknesses. Fourth, the Enabling and Limiting Factors section provides specific factors of forest governance that either propel a program towards meeting its intended objectives or drives it towards failure. Fifth, the Policy Recommendation section builds off of the Enabling and Limiting Factors to make proposals for better forest governance and gives recommendations for areas of further research. Finally, the Conclusion highlights the most important points of each section.

Overview of Conservation Incentives

In the past two decades, a wide array of policy approaches to investing in social and environmental capital have emerged in developing countries. Conservation incentives is an umbrella term for different schemes that encourage individuals and communities to participate in conservation as part of sustainable development. Conservation incentives have grown popular with governments, donors, and environmental organizations because of their potential to mobilize new financial resources for forest conservation.

One of the more well-known monetary incentive schemes is Payments for Ecosystem (or Environmental) Services (PES) in which landowners and land users ("service providers") are paid to provide environmental services to users. It transforms traditionally non-market values of ecosystems into real financial incentives, and is most known for protecting watersheds. However, conservation incentives do not necessarily require the transfer of money in return to attain its goals. For example, certification, protected areas, and regulatory agencies that enforce conservation laws (e.g., The Endangered Species Act) can also achieve conservation objectives, though each has its pros and cons and often do not work well in developing countries if governance is weak.

Certification mechanisms, used in coffee, food and wood production, are increasing in popularity. Consumers pay extra to producers for the value added by more environmentally and socially responsible production practices.

Local and national governments can also use tax incentives to encourage specific behaviors from landowners. They involve providing tax breaks as rewards or compensation for committing to protecting ecosystem services. Furthermore, governments can leverage access to, use, and control over land as an additional incentive. In exchange for forest protection, many governments grant either management of forest lands or formal land tenure.

Best Practices in Forest Conservation Incentive Programs

A great deal of our analysis focused on which components contribute to the success or relative success of forest conservation incentive programs. Under four components of good governance, land tenure, participation, quality of program design/ implementation, and monitoring, best practices have been identified that can help contribute to successful completion of program objectives and effective programs overall. Multiple studies cite stakeholder participation, particularly local community participation, throughout the life of a program as a critical component of successful programs. In a survey of Mesoamerican PES programs, Corbera et al. (2007) identified that inclusive program design and ensuring equity in decision-making and outcomes are key to program success. Broad participation ensures that programs incorporate the needs of local communities. In addition, in a review of literature on perceived successes and failures of integrated conservation and development projects around the world, Hughes (2001) states that program design should respond to local knowledge and experiences through participatory planning methodologies. Hejnowicz et al. (2014) mirrored this sentiment in their review of the environmental and socio-economic outcomes of several PES programs, recognizing that participation is central to programs' successes and for community empowerment.

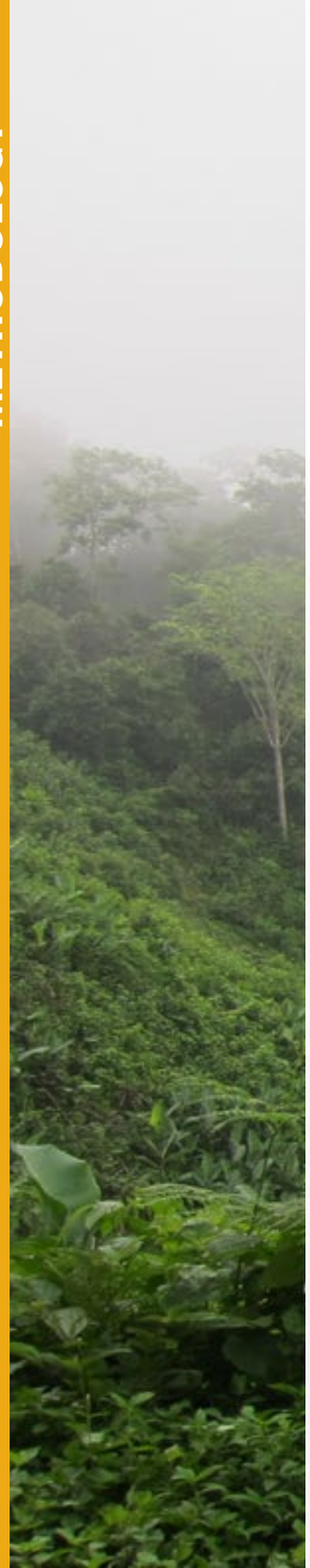
In addition to participation, land tenure is also widely acknowledged as an essential component of successful and effective programs. Adhikari and Arun (2013), in their extensive review of 26 PES case studies from Asia and Latin America, as well as Hejnowicz et al. and Mahanty et al. (2013), highlighted the key role that property rights and tenure security play in ensuring achievement of program objectives. Without clear ownership for program beneficiaries, individuals are unable to participate in PES and other incentive programs, ultimately diluting the program impact. Moreover, individuals who might most benefit from such an incentive scheme are not incorporated into the program. In addition, Adhikari and Arun also found that land tenure was essential for the long-term sustainability of programs and for continued deforestation avoidance in the future.

Best practices in program design and implementation and monitoring are also essential to program success. As emphasized by Corbera et al. (2007), poor program design can be a serious limiting factor to the success of a given program. In analyzing the Indonesian Kerinci Seblat and Gunung Leuser integrated conservation and development projects, Kelman (2013) highlights that because conservation requires a long-term commitment, effective biodiversity conservation programs should also have long-term time scales. Hughes (2001) similarly highlights that programs should plan for long-term commitments in order to have an impact.

Several authors also underscore the importance of engaging local communities in order to reach program goals. In a review of the social and ecological outcomes of PES programs, Adhikari and Arun (2013) find that training, capacity-building, and access to information improve program effectiveness. Similarly, Kelman (2013) asserts that because of the long-term processes that conservation requires, global information and expertise should be used to build local capacities. Furthermore, with regards to gender equity and equality in programs, Adhikari and Arun (2013) maintain that the inclusion of women-focused goals increases community ownership over PES programs. Additionally, Mahanty (2013) stresses that failing to adequately engage and communicate with communities, specifically regarding the details established in the contracts, can threaten the sustainability of program agreements. On a larger scale, Hejnowicz et al. (2014), emphasizes the need to understand the varying interactions among the different actors. He highlights that the success of programs depends on strengthening the relationships between institutions, communities, and other sectors that might be involved.

Regarding the overall management structure of conservation incentive programs, Kelman (2013) argues that in order for programs to be successful over time, they should incorporate adaptive co-management structures that will allow for ongoing partnerships with communities in the long-run. He maintains that a lack of adaptive management is a pitfall of programs that incorporate conservation and development goals. Additionally, grievance mechanisms provide a platform for local communities to provide feedback for informed decision-making in adaptive management structures. Pham (2014) points out that a lack of grievance mechanisms limited the success of a REDD+ program in Vietnam.

Finally, the need for conducting initial baseline studies followed by ongoing environmental and socio-economic monitoring was mentioned in several studies. Pelletier and Goetz (2015), among many others, highlighted the importance of initial baseline studies as a benchmark to measure program success; without assessing the initial status of a project area before activities are started, it is difficult to measure how success the program actually was in meeting objectives such as reducing deforestation or increasing biodiversity. In Yin et al. (2014), a literature review of empirical evidence for the ability of programs to meet forest objectives, several authors posited that there was a "strong association" between regular monitoring and better forest conditions. This was reinforced by FAO's (2013) assessment of a Venezuelan program in the Caura Basin where an NGO provided training and technical support for socioeconomic and biological monitoring. The study shows that biodiversity monitoring provides a mechanism through which the effectiveness of conservation agreements can be measured.



Literature Review

The Team assessed 42 peer-reviewed articles on diverse international forest conservation incentive programs and the conditions for success. Programs included many components such as varying levels of gender and socio-economic equity, incentive structures, land tenure, and political systems.

WRI instructed the Team to focus on programs in developing countries. A quarter of the articles examined Latin American conservation incentive programs, suggesting an ease of implementation and/or researching PES schemes in the American region compared to Asia and Africa. Over a third of the articles were case studies that completed in-depth examinations of specific programs, while the remaining two-thirds were literature reviews.

Database

The Team created a database to analyze the strengths and weaknesses of various incentive programs for forest conservation and to find commonalities between basic components of the programs, referred to as 'cases.' To facilitate further research, data collection, and analysis of the cases, the Team focused on three regions: Americas; Asia; and Africa and Europe.

The Team then developed a set of systematic criteria to highlight key parameters to analyze consistent variables across all cases. The parameters were divided into three categories: general, governance, and program impact. General parameters included information about the location, objectives, scale, and start/end dates of each program. Governance parameters included whether social grievance mechanisms are in place, if the program is legally required, or if local stakeholders were involved in the program design process. Finally, program impact parameters included information about pre- and post- program deforestation, quantifying socio-economic and environmental service impacts, and level of participation. Once WRI approved the criteria, the database was populated with cases from the regions, including various scales, scopes, objectives, and program components, for a total of 49 cases. Data analysis identified qualitative and quantitative factors described in the Database Discussion of this report.

Detailed Case Studies

The Team presented nine promising cases for deeper analysis, three from each region, to WRI. Each case highlighted the various parameters included in the database and represented different scales, scopes, objectives, and program components. Upon discussion with WRI, three cases were selected for detailed study, based on the differences in their regional, scale, and governance factors. The three programs described in greater detail in the Case Study Discussions are: Hutan Kamasyarakatan, the Indonesian Community Forestry Program in Sumber Jaya; the Ankeniheny-Zahamena Corridor Protected Area program in Madagascar; and the National Payment for Hydrological Services program in Mexico.

The first section of each case study presents geographic and demographic characteristics including the land administration and management, degree of program participation, civic engagement, and the development and poverty alleviation focus. The program description characterizes the ecosystems in which the programs operated, their demographics, economics, and financial structure, as well as the institutional and socio-political backgrounds of the regions or nations.

For WRI, the utility of the case studies lies in the discussion and conclusions. The discussion analyzes land tenure structure; participation by local beneficiaries and other stakeholders; the quality of the programs' designs and implementation; and the monitoring capacity of each program. The conclusions identify best management practices of the varying components and thematic areas within each case, including forest tenure, management of protected areas, and actual revenue generation versus opportunity costs. After comparing these findings to the broader and overarching trends identified from the initial 49 cases, policy recommendations to maintain or improve the programs were incorporated into the case studies.

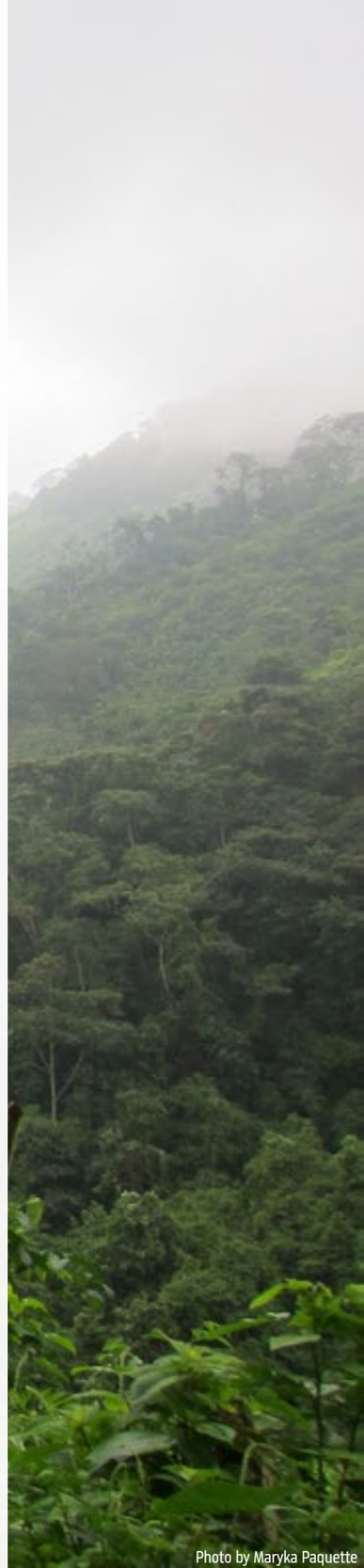
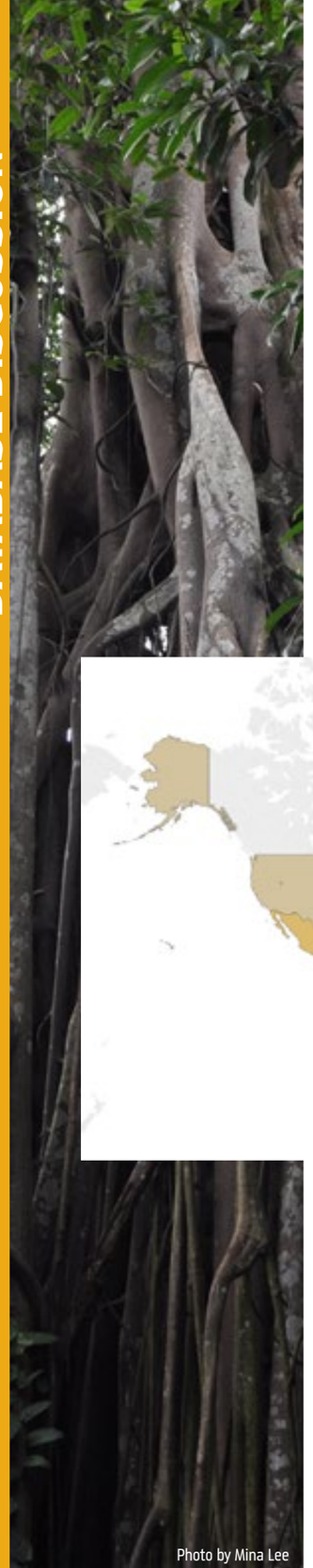


Photo by Maryka Paquette



The Team was initially tasked with creating a database to catalog cases of forest conservation incentive programs. To record the cases accurately, 46 parameters that represented program design and outcomes were selected. These parameters were chosen to portray each program comprehensively, and were closely modeled after the 122 indicators in the WRI GFI Indicator Framework. The parameters were both quantitative and qualitative, including measures such as the total program area and number of beneficiaries, as well as the program implementing agency and type of funding.

Ultimately, the database included 49 cases and programs were grouped across three global regions: Asia (17 cases); Americas (17 cases); and Africa and Europe (15 cases), as shown in Figure 1.

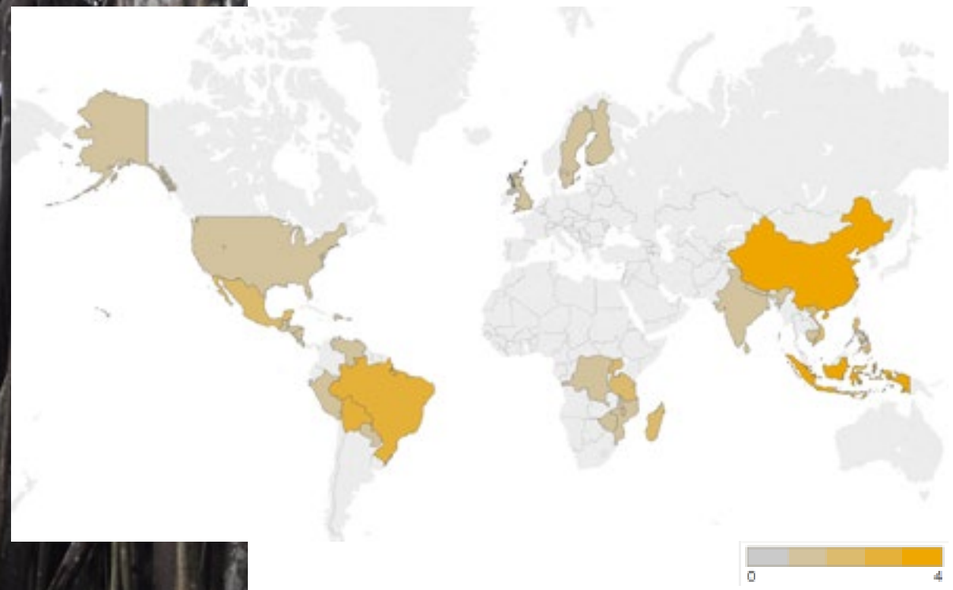


Figure 1: Geographical Distribution of Programs
The map summarizes the locations of programs and the number of cases from each country within the database. The brighter yellow indicates more cases from that country.

Photo by Mina Lee

The programs and projects encompassed tropical rainforests, tropical seasonal forests/ savannas, and temperate deciduous forests, among others, as portrayed in Figure 2 below. Please note that some of the programs and projects encompassed more than one type of forest ecosystem.

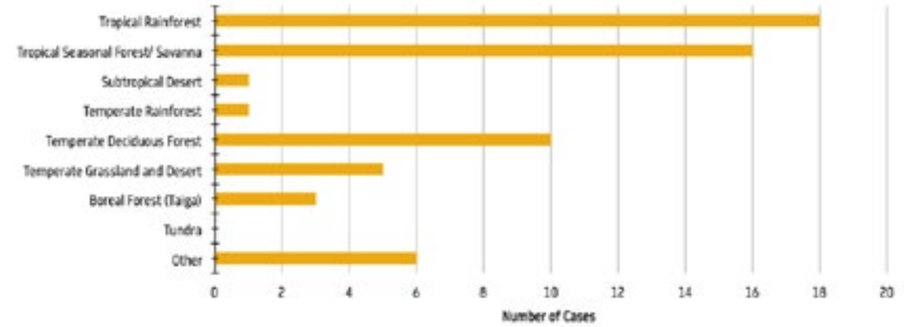


Figure 2: Forest Types Involved in Forest Conservation Incentive Programs
The figure displays the types of forests involved within the programs included in the database. Tropical rainforests, tropical seasonal forests/ savannas, and temperate deciduous forests are the most prevalent types of forests in forest conservation incentive programs.

Among the 49 cases, 37 cases involved sub-national forest programs (Figure 3) and 13 programs (26.5%) established more than one goal beyond only conservation-oriented goals. For instance, some programs had both conservation and restoration as the program goals. About half of cases (48.98%), mainly focused on a conservation oriented goal (Figure 4). In addition, over half of the programs were implemented by multiple agencies (Figure 5-1).

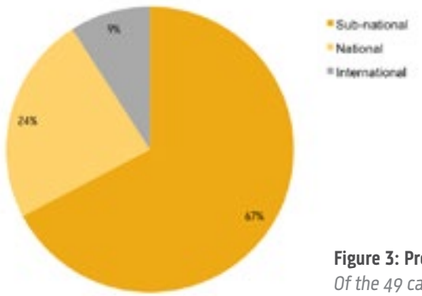


Figure 3: Program Scales
Of the 49 cases, 37 programs work at a sub-national level, eight at a national scale, and four at an international level.

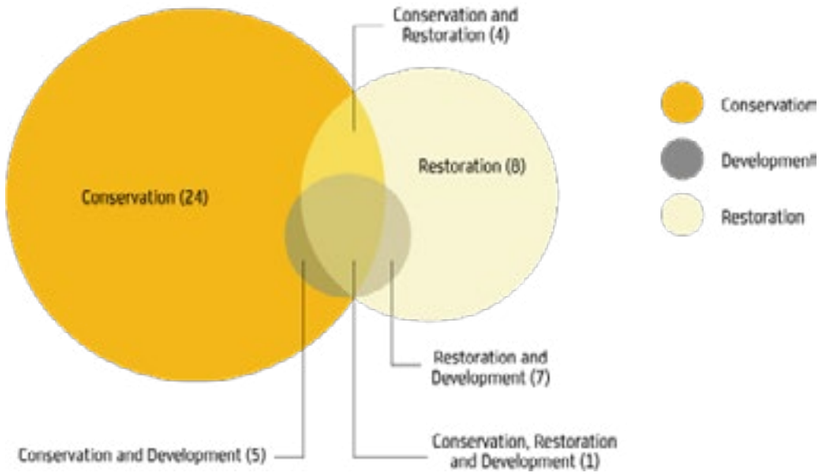


Figure 4: Summary of the Goals of the Programs
Of the 49 cases, 24 established conservation as the main objective of the programs, 4 had development, 8 had restoration, and 13 cases had multiple goals, which include two or more objectives (from conservation, development, and restoration).

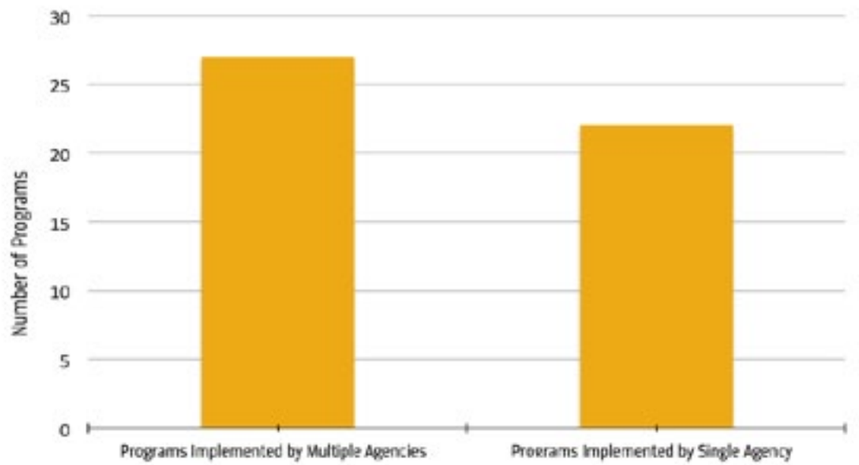


Figure 5-1: Program Implementing Agencies
Of the 49 cases, 27 programs (over 55% of the total number of programs) were implemented by multiple agencies, and 22 programs were implemented by a single agency.

	Implementing Agencies	Number of Cases
Single	National Governments	4
	Community/ Civic Body	6
	NGO	7
	Private	2
	Sub-national/ Local Government	3
	Total	22
Double	National & Community	1
	National & NGO	3
	National & Sub-national	4
	Community & NGO	1
	Community & Private	1
	Sub-national & NGO	1
	Sub-national & Private	1
	NGO & Private	3
	Total	15
Triple	National & Community & NGO	2
	National & Sub-national & NGO	3
	National & Private & NGO	1
	Sub-national & Private & NGO	2
	Total	8
Quadruple	National & Community & NGO & Private	1
	National & Community & Sub-national & NGO	1
	National & Sub-national & NGO & Private	2
	Total	4

Figure 5-2: Types of Implementing Agencies of Programs
Within 22 single-agency implemented programs, national government (27.27%) and NGO (31.82%) were the most frequent implementing entities.

From the 46 total parameters, the Team selected 11 qualitative components of program design that provided di/trichotomous answers of either Yes or No, and Not Available (N/A). The reason for choosing the 11 qualitative components was based on preliminary research included in the Best Practices section that suggested these selected components were most often involved and considered in the program design process and were utilized to meet the objectives of the programs. In addition, these components were identified in WRI's GFI Indicator Framework. Therefore, they were used as a comparative measure to identify best management practices and enabling factors in conservation incentive program design. These 11 components are included in Figure 6 below.

Components	Description
Incorporation of gender rights issues	Does the program incorporate gender equity objectives or goals?
Incorporation of poverty alleviation goals	Does the program incorporate objectives or goals to decrease the number of people living under the poverty line?
Incorporation of ecosystem services issues	Does the program incorporate other ecosystem service protection or improvement goals other than forest conservation?
Incorporation of economic equity goals	Does the program provide opportunities for an equitable distribution of income and welfare?
Land tenure requirement	Does the program require the beneficiaries to have formal rights/ ownership of forestlands?
Involvement of local stakeholders in the program design process	Are local communities actively involved in the design of the conservation program?
Implementation of social grievance mechanisms	Does the program have grievance mechanisms that allow participants to provide feedback on the program?
Regular expense reporting	Does the program have financial reports and are they accessible to the public?
Ongoing forest monitoring	Does the program incorporate a forest monitoring mechanism that is implemented and reported over time?
Ongoing socio-economic monitoring	Does the program incorporate a socio-economic monitoring mechanism that is implemented and reported over time?
Overall availability of programmatic and impact information	Is information on program design and impact readily available to the public?

Figure 6: Evaluation Components and Description

The pie charts below show the summary of percentage of response from programs for the 11 parameters (Figure 7). The 11 pie charts were categorized into three groups. Components with High Positive Responses are when over half of the total programs provided positive answers, Components with Medium Positive Responses are when over a third of the total programs provided positive answers, and Components with Low Positive Responses are when fewer than a third of the total programs provided positive response to the parameter.

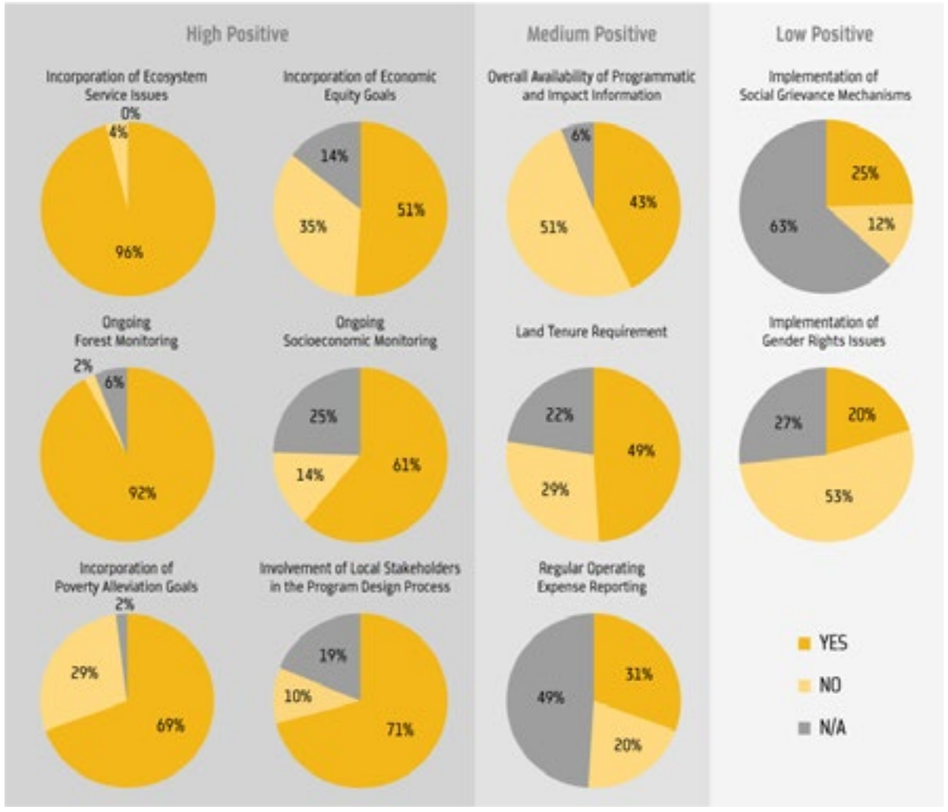


Figure 7: 11 Parameters as Applied to Database
The charts above display each of the 11 parameters in relation to the 49 cases in the database.

Based on to the preliminary research on best practices for forest conservation incentive schemes mentioned in Best Practices section and from analysis of the database, it was found that more components a program incorporates from the listed 11, the more success the program potentially could have. In order to test whether the 11 program design components were directly related to a best program management practice (or a positive outcome), further analysis was performed between the 11 program design components and the one outcome component (reduction in deforestation).

Net reduction in deforestation or degradation was used as a benchmark from which to compare the 11 other program design components. Figure 8 shows the 11 program design components in relation to the desired outcome of net reduction in deforestation. It was observed that in reducing deforestation, "Incorporation of Ecosystem Service Issues" and "Ongoing Forest Monitoring" are two components that many cases employed.

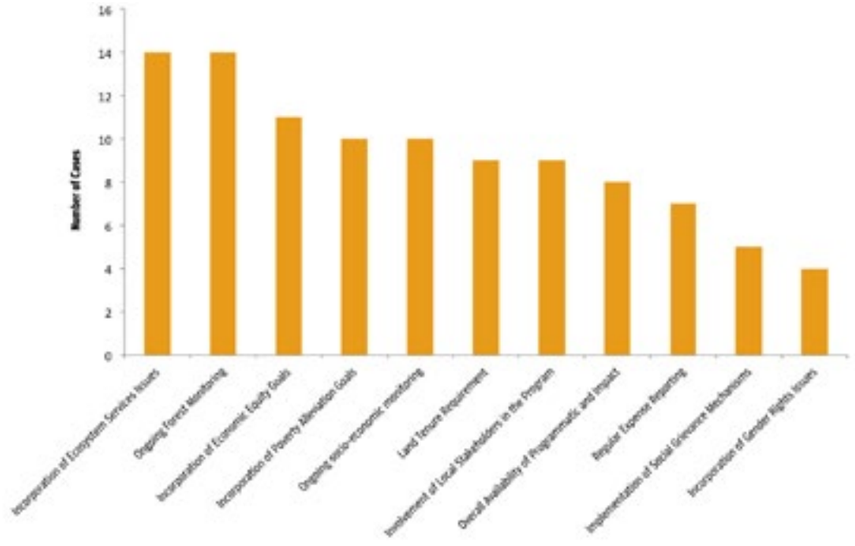


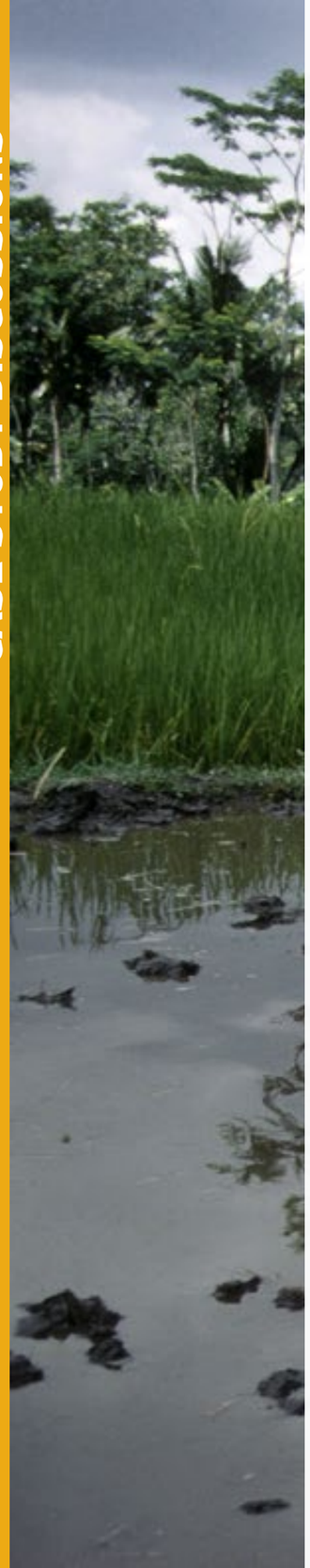
Figure 8: 11 Program Design Components as Applied to 17 Cases that Showed a Reduction in Deforestation
Of the 49 cases in the database, 17 cases showed reduced deforestation. This figure shows how many of those involved one particular program design component in the program. The programs with positive outcomes more frequently involved the two program design components of"Incorporation of Ecosystem Service Issues" and "Ongoing Forest Monitoring."

Database Limitations

Information for each case included in the database was gathered from secondary sources, such as articles from reviewed journals, official websites of the programs, and news articles; no primary sources of data were used. It is important to note that information on the parameters gathered from these sources, particularly with the 11 components analyzed in the Database Discussion, focuses primarily on program design and objectives. WRI's GFI Framework was one of the main guiding tools for these 11 components.

While analyzing the data, it was observed that the quantitative components of cases were less accessible than qualitative data. Data describing the program design process, the main program goals, major stakeholders, program monitoring and program implementation were generally available for every program, while data describing program expenditures, the number of beneficiaries, the total amount of deforestation avoided, and the value of environmental and economic impacts were not readily available. Therefore, quantitative data were not used to determine patterns, or enabling and limiting factors of the conservation incentive program designs.

Furthermore, given that 32 of the 49 programs were started after the year 2000, the full impacts of most of the programs may have not been observed. That is, components that describe net deforestation may not have yet reached their full potential. Moreover, the deforestation data has limitations in that they tended to be more regional or national in scope and were not specific to the program.



The Team presented nine cases to WRI that were representative of the various parameters included in the database including scales, scopes, objectives and program components. WRI chose three of those cases for in-depth analysis: Hutan Kamasyarakatan (HKm) Program in Sumber Jaya; the Ankeniheny-Zahamena Corridor (CAZ) Protected Area program in Madagascar; and the National Payment for Hydrological Services program (PSAH) in Mexico. This section will discuss the overarching enabling and limiting factors and best practices for design and implementation for each of these case studies. The complete case studies are included as Appendices.

Hutan Kamasyarakatan Program in Sumber Jaya, Indonesia

HKm, the Indonesian Community Forestry Program, began in 1998 with two overarching goals: promote environmental conservation and improve livelihoods and reduce poverty of the people living in the upper bounds of the Way Besay watershed. The HKm Program in Sumber Jaya is a PES scheme between upstream farmers and a state hydroelectric power plant, where incentives include temporary land tenure as well as direct cash payments. Increased deforestation upstream had increased sedimentation rates, potentially decreasing the useful life of the power plant. HKm was formed to check unsustainable farming practices and promote reforestation efforts. The program temporarily transfers the management of cultivated, state-owned protected forests to local communities, with the condition that they protect remaining forests, plant trees, and use multi-strata coffee gardens that lead to watershed protection benefits. Currently, the HKm program encompasses 70 percent of protected forests in Sumber Jaya, for a total of 13,000 ha of forest area.

Land Tenure

As land tenure is a contentious issue in the region, with most forests owned by the Indonesian government, the HKm program establishes a five-year contract for farmers and communities as an incentive to join. However, because land tenure is only given on a temporary basis, it poses a major challenge to the sustainability of the program in the long run. This short-term contract period may not be sufficient time for farmers and communities to achieve lasting changes in sustainable agroforestry practices. Moreover, farmers are less inclined to cultivate long-term sustainability measures on their croplands since there is no guarantee that they remain as landowner after five years.

Furthermore, lack of effective communication of expectations has given rise to friction between government officials and farmers. Some farmers interpreted participation in the program as protection from future evictions or destruction to their farms.[2] Local regulators, on the other hand, perceived the program as a tool to extend control over natural resources and participant communities.[3] Given the political history of the region and past civil unrest in communities, this is especially problematic. This tension between differing expectations of program administrators and beneficiaries for land tenure can put the HKm

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program at risk in the future and requires a carefully articulated intervention from the government in order to provide extended land security.

Additionally, considering the continuous migration and shifting demographic trends of migration from Western Java, the government should be prepared to provide farmers with protection from and assistance with illegal settlers. If not managed appropriately through established mediation mechanisms and clear land tenure regulations, rising conflict in the region will increase forest vulnerability as well as put at risk the well-being of the people living in those areas.

Participation

The HKm program was implemented after extensive consultations with community groups and currently involves 6,400 farmers.[4] Facilitated by Rewards for Use of, and shared investment in Pro-poor Environmental Services (RUPES), consultations with members of the communities and the state hydroelectric power plant were carried out for three years between 2004 and 2007, preceding implementation. Through these talks, land tenure security and payments to farmers for reduced sedimentation were identified as the two main mechanisms for an effective program.[5]

By integrating the participation of communities and farmers into the formal program design process, the HKm program was able to identify the needs of these stakeholders in order to actively contribute to the conservation of the forests. Furthermore, it opened a space in which program beneficiaries could be involved in learning about program requirements prior to participating in the process. This likely contributed to more compliance with program obligations after signing contracts. Notably, the three-year preparation process increased socialization and community empowerment; however, lengthy preliminary processes could also risk communities being frustrated from not seeing more immediate benefits.

Quality of Program Design and Implementation

Local NGOs, like the River Care Organization and Watala (meaning "Friends for nature and environment"), have been instrumental in effectively communicating program requirements and duties to communities, as well as helping write their proposals and making geo-referenced maps, both requirements for the application process. This help was critical in ensuring that the majority of farmers applied despite the long and complicated application process. However, it has been estimated that participating households spend up to half of their annual income to register for the scheme. Costs include application for permits, enforcement, and developing management plans. The application process is not only costly, but requirements such as geo-referenced mapping of the area are also time consuming and may be beyond their technical capacity. While these requirements are key to establishing a baseline and ensuring that areas do not overlap and that due process is given, elevated transaction costs can significantly decrease the number of participants. Furthermore, it has the potential to marginalize the poorest communities, as they would be less likely to comply with these requirements. Hence, an additional incentive should be considered: technical and logistical help in meeting program requirements as part of the preparation process.

Various other challenges to the future sustainability of the program have been identified. Lack of awareness about the specificity of the program has led some farmers to believe that the program gives rights to convert more forests into farmland. Additionally, if the farmers and communities do not comply with the contract obligations, and even though the contract might be terminated, it is difficult for the government to expel the people from the property. Hence, if the communities or farmers do not have sufficient program buy-in, then there is little incentive to meet program obligations as there is little risk of being expropriated from the territory. Consequently, the added income from monetary conservation incentives proved to be an important component of the program.

Monitoring Capacity

On-the-ground monitoring continues to pose a challenge for the HKm program. For instance, some villagers are uncertain about how to meet certain program requirements for planting trees on their farmlands. While willing to do so, there is little clarity about the number of trees, as well as who would supply the seeds or saplings. While there are NGOs that offer support in the initial stages of the program, including writing proposals, there are not enough systems in place to help villagers answer queries of this nature throughout the entire contract.

Another important component to monitoring capacity is the role of farmers and communities in monitoring water sedimentation. While the hydroelectric power plant is responsible for measuring sedimentation in order to allocate the appropriate payments, if the beneficiaries actively participated in the monitoring process, it could increase accountability measures within the community. Furthermore, it would instill technical capacity within the beneficiaries and could aid in linking program results with the activities being implemented.

Conclusion

Despite the challenges faced by the Sumber Jaya HKm program, several design components have allowed the program to meet its environmental and social objectives. For instance, while no data is currently available on the decrease in sedimentation rates, independent researchers have confirmed increased biodiversity in the region.[6] Compared to non-HKm participant communities, studies have also shown that socio-economic conditions have improved in Sumber Jaya. The multilayer organizational structure of the program, involving international NGOs, government bodies and local NGOs, has ensured a rigorous program design and implementation structure which has significantly improved the implementation of the program. However, there remain challenges to its long term sustainability. Going forward, the program has to ensure that tenure is gradually given for longer periods of time. Monitoring capacity also needs to be increased in order to gather adequate data on the effects of the program, as well as to support farmers in engaging in more sustainable farming practices.

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Ankeniheny-Zahamena Corridor Protected Area, Madagascar

Madagascar is one of the poorest countries in the world, with 87.7 percent of the population living under the poverty line in 2010, and most citizens' livelihoods greatly dependent upon its natural resources.[7] Slash and burn agriculture and illegal logging are commonly practiced, which prompted the CAZ PA program designers to develop four incentive projects to allow the local communities to receive income and be involved in the forest conservation process. They include: a REDD+ Carbon Credit Trade Program; the Node Small Grants Project; the management transfer contracts project, and conservation agreements.[8]

The governance framework component of the CAZ PA program design reflects a number of principles, including bottom-up participation, capacity building, and coordination to drive sustainable impact. To better understand the context of the creation of the CAZ PA and the four incentive projects it encompasses, we analyzed its land tenure, partnership, program design, and monitoring. Though research conducted it appears that the CAZ Program is indeed meeting its objectives.

Land Tenure

The national government is the primary landowner in Madagascar.[9] The management transfer contracts project was created to confer temporary land rights to local communities. As a positive outcome, it allows Communauté de Base (COBAs, for its acronym in French) to legally manage the land, gives them the right to expel intruders invading the property, and provides them with a legal tool to generate income. Because this arrangement provides only temporary control over the land rather than granting community members official ownership, it does not provide long-term land tenure security. If COBAs do not meet specified requirements after three years, their contracts can only be renewed for another three-year period instead of a 10-year period following a successful evaluation. Such terms can disincentivize COBAs from investing fully in the land in the same way as if they had full ownership.

This lack of official land ownership, as well as political instability and bureaucracy, limit the implementation of international donor programs, such as the REDD+ Carbon Credit Trade Program. For example, because the government is the permanent owner of the forestland, it, rather than local communities, is entitled to any funding from the World Bank. The Carbon Credit Trade Program design establishes that the government should appoint a program administrator to manage the money, but due to a political crisis, the government has not yet complied, thus delaying the World Bank's budget allocation and blocking the implementation of the program.[10] Therefore, it would be beneficial to the sustainability of these programs to either implement a land ownership transfer program or appoint a non-governmental program administrator to manage such international funds.

Participation

Early and recurring interaction with stakeholders cultivated awareness of the program's plan and objectives at the local level.[11] The community's involvement in the management and monitoring of the program was and still is crucial for an effective long-term working relationship. The high level of participation contributed greatly to the Program's success.

Management and conservation agreements are co-managed between CI-Madagascar and the communities. While the main obligations are carried by CI-Madagascar, the collaboration ensures a level of transparency and accountability by the local program and national government to uphold their respective responsibilities. Where these responsibilities are not met, grievance mechanisms are in place.

Efficient coordination and communication are critical to mobilize the vast numbers of community managers involved. Program managers organize local management units into regional federations, and through partnerships they create "relay communicators," who serve as focal points for a number of issues concerning the protected area.[12] Simultaneously, training prominent local people builds their organizational and technical knowledge to allow them to later serve in new leadership and management positions.

Quality of Program Design and Implementation

Because political instability in Madagascar has produced inertia in implementing programs, it would be best if its duties could be redirected to civil society entities. While this option presents risks, such as an NGO's lack of funding or under-qualified staff, removing the government from this critical role gives programs independence and stability. Such a transfer of responsibility requires capacity support, such as an NGO specializing in finance or a program providing suitable training to staff.

Another challenge in the design of the program is the inclusion of women's rights that must be formally incorporated into the implementation of the program. CI-Madagascar is presently developing a new strategy to better include gender rights into the program design to address this gap and promote women's participation in the COBAs moving forward.[13]

Communities' increased awareness of and involvement in the project's deforestation reduction goals can be stated as a foremost success of the project. In addition, providing communities with training opportunities as well as options for alternative income generation activities not only advanced environmental protection objectives but also sustainable economic and social development.[14] As part of the project, the community receives 50 percent of the protected area's revenues from carbon funds, training on monitoring performance as a part of the conservation agreements, training and skill development as a part of the management transfer contracts, as well as training in infrastructure and sustainable agriculture as part of the Node project.[15, 16]

Monitoring Capacity

Monitoring imposes one of the biggest challenges of the program. There are different monitoring mechanisms, such as yearly performance reports for the management transfer contracts and forest monitoring for conservation agreements and slash and burn reduction, but all of them need improvement, since to date no quantitative measurements are included in the reporting mechanisms.[17] Even though there are studies reflecting the positive effects of the program, such as deforestation rates being four times higher outside the Malagasy protected areas, reduction of slash and burn, and improvement in the diversity loss index, there is no official information or reports of any of these indicators available to the public.[18] This greatly reduces the transparency of the program.

In conjunction with local authorities, COBAs and the local communities could better hold those who perform slash and burn practices accountable. Furthermore, all program managers could increase community outreach to improve tangible economic results and develop transparent and efficient data collection to measure the performance of the program over time.[19, 20]

Conclusion

Overall, the program's main success is in the communities' involvement in conservation activities and their increased awareness of sustainable ecosystem management. Co-management mechanisms and land rights have created a sense of responsibility and increased community members' income generation. Also, by designing a holistic approach to forest protection, where different land zones with different programs are incorporated, it provides communities with options and alternative development.

As for challenges that need to be addressed, first is the necessity to continue working towards land ownership transfers instead of just management rights. Second, there is need to transfer CAZ's management from the government to an NGO or local community to ensure the program's stability and independence from political conflicts. Third, the program must develop a proper reporting and monitoring mechanism, including data collection programs, transparency of information, as well as reevaluate fines to reflect local conditions. Last, CAZ should expand its community outreach to incorporate more beneficiaries who could contribute to the conservation goals.

National Payment for Hydrological Services Program, Mexico

The Mexican National Forestry Commission (CONAFOR, its Spanish acronym) implemented PSAH in 2003. The PSAH is a national program that uses earmarked funds from water usage fees to curb deforestation and increase conservation of forest cover in order to protect aquifer recharge in priority areas. The program also seeks to maintain rural income and reduce poverty through direct transfers to landowners in exchange for maintenance of forest cover. The drivers of deforestation in Mexico are similar to those across Latin America; they include agricultural expansion, habitat conversion for cattle pasture, colonization, and commercial and illegal extraction of timber and non-timber forest products (NTFPs).[21] Mexico possesses approximately 64.49 million ha. of forest and has struggled with rising deforestation rates over the past decade, losing 6.18 million ha., or almost 10 percent of forests between 1993 and 2007.[22] Due to various social, economic, and political factors discussed below, the PSAH program has had varied results.

Land Tenure

Land tenure is a crucial component of the PSAH program, as applicants cannot participate if they do not hold property rights. Over half of the members of the PSAH program live in collectively held and governed areas, called 'comunidades' and 'ejidos.' These occupants have been granted communal land tenure by the Mexican government. Approximately 80 percent of Mexico's forests fall within such communally owned lands, and therefore a large portion of PSAH payments have been dispersed in these communities.[23] The widespread participation in this program may have multiple drivers: the necessity for a source of income and a desire to conserve Mexico's remaining forested lands. The high demand for entry into the program may be because much of the forestland does not provide adequate conditions for farming and ranching, thus the payment offered through the program surpasses the opportunity cost of farming or ranching on the land.[24]

Photo by United Nations Multimedia

Participation

Although there has been a concentrated effort to engage the beneficiaries of the program, they have not been involved in the design, monitoring or review process of the PSAH. The program however, does include multiple stakeholders in the annual review process, which not only contributes to more comprehensive feedback, but also ensures sustained attention towards the program. The PSAH program is voluntary, therefore one can infer that improved communication of program benefits and goals could result in increased enrollment through more consistent messaging and augmented efforts to reach isolated or marginalized communities. A series of field studies have also observed very little recognition by communities of the broader goals of the PSAH and the connection between payments and environmental services, suggesting that there is much room for improvement in the outreach efforts that strive for increased understanding of ecosystems.[25] If local communities are more aware of and empowered by the overall environmental impact, they may be more motivated to conserve land with higher opportunity costs.

Quality of Program Design and Implementation

The program criteria emphasizes that enrolled lands should be located in overexploited aquifers, have a high risk of deforestation, low rates of anthropogenic soil degradation, and high municipal poverty. Because Mexico's geographic and environmental conditions vary greatly, however, it is difficult to define priority areas for the program, and a lack of transparency in selecting these areas limits its effectiveness. For instance, some regions are under high deforestation risk yet have low water scarcity, while others face low deforestation risks but high water scarcity. Setting national selection standards is a difficult issue to tackle due to political economy constraints. The financial sustainability of the program is established through earmarked water fees in the general budget, but the program's budget must be negotiated and voted on every year by congress. If it is perceived that the PSAH favors particular states due to geographic or social factors, securing funds through the national budget negotiation can be challenging. Furthermore, this impedes adjustments in the program's budget allocation, affects the program's ability to realize its overall goals, introduces political pressure that can influence which areas are included in the program, and can affect the administrative processes as well as the evaluation system.[26] For example, areas that are not necessarily relevant may be included in eligibility zones due to political pressure.

One of the greatest strengths of the PSAH is that it has engaged in adaptive management, which has allowed the program to incorporate lessons learned and adjust its processes periodically for future implementation. This allows monitoring and evaluation mechanisms to better focus the program over time. The PSAH has undergone many changes, specifically regarding the criteria for enrollment within the program. Monitoring performed by external parties, such as environmental non-profits and academics, identified areas for improvement. Subsequently, the PSAH program was modified to include social issues, such as poverty alleviation and gender rights components, and more specific environmental concerns, such as biomass density and rates of anthropogenic soil degradation.

Monitoring Capacity

As the PSAH program progressed, feedback from program administrators, environmental non-profits, and academics produced programmatic changes and incorporated more areas of high ecological and social priority. Between 2004 and 2010, CONAFOR has increased efforts to enroll high priority areas, however, there are still not enough outreach targeted towards drawing high-risk areas to the applicant pool.[27] The compulsory review process has allowed the program to implement periodic evaluations to identify what works and what doesn't in order to make comprehensive changes fairly quickly. This formal and mandated periodic review process should be considered for replication in other cases, but with the critical modification that program beneficiaries are included. Including community members can provide more accountability in the program's activities and fund distribution. Adaptive management by the conservation managers in this program was possible because there was political support, sustainable financial backing, and high availability of good social and environmental data; all of these factors proved to be best management practices.[28]

Studies show that the impact of the PSAH program has changed over time due to the adaptive management style. There was low additionality during the first two years because much of the land targeted by the program was under low or very low risk of deforestation. Hydrologic and deforestation risks represented only 20 percent of the priority criteria, and not many applications from high priority areas were received, so questions remain as to the program's effectiveness in targeting water and forest protection.[29]

Conclusion

Water scarcity is a critical issue in Mexico and connecting forest conservation to water resource management can be an effective strategy for improving the environment and water access, as well as protecting forested land. While the program succeeded in selecting applications in high priority areas for hydrologic services, due to a lack of information and outreach, it did not receive as many applicants as desired. This indicates that there is a need for greater outreach and collaboration with NGOs to produce education initiatives on the effects of sustainable forest management on water resources. The selection criteria of this program have evolved over time, and it is tough to determine the impact of all these simultaneous changes on avoided deforestation and poverty alleviation. It seems that there has been more of an impact on poverty alleviation than on forest conservation, but this may be because poverty alleviation is more easily measured through the money directly disbursed to communities and participants. Better baseline data, consistent monitoring of environmental and socioeconomic effects, and improved educational outreach promise more robust forest protection.

ENABLING & LIMITING FACTORS

Photo by Mina Lee

After populating the database and analyzing the detailed case studies from Indonesia, Madagascar, and Mexico the team identified enabling and limiting factors grouped under four components of forest governance. These factors, also observed in the Best Practices section above, are indeed best practices that contribute to the overall efficiency of forest conservation incentive programs.

Land Tenure

Land tenure is a complex component of forest governance and the development of forest conservation incentive schemes, as it encompasses multiple stakeholders, various institutions, and diverse cultural norms. In addition, land tenure is developed and implemented in such a range of manners that it is very difficult to find a standard set of norms, even within one country. This lack of uniformity in land tenure policy and the need for a diverse outlook on land tenure implementation was observed throughout the Team's research, and can be seen as both an enabling and limiting factor for program success.

As highlighted in the Best Practices section, programs have been successful when they are paired with initiatives to help local stakeholders gain rights to their land. Alternatively, communities with a lack of adequate property rights have less incentives in thinking about the long-term sustainability of the land they occupy, thus negatively affecting conservation program implementation. This complexity was apparent in a number of cases in the database, including in Mendha Lekha in India and Indonesia's HKm program, and seem to be a feature of most cases across developing countries where property rights are often unclear. In the HKm program in Indonesia, land tenure is given to program participants through five-year contracts, which helped to reduce sedimentation issues related to the downstream hydroelectric dam.[30] However, the fleeting nature of these contracts limits the success of the program in the long term since it reduces buy-in from participants.

Furthermore, it is also critical to build local communities' internal capacity in securing and renewing land tenure contracts so they are not completely reliant upon outside assistance. This assistance, often from international NGOs, can often be fleeting, and it is critical for beneficiaries to develop the abilities and tools to manage land tenure and territorial maintenance independently. In the CAZ Program in Madagascar, CI-Madagascar helped to build the capacity of program beneficiaries in creating, evaluating, and renewing management transfer contracts from the Government of Madagascar, as well as financial management. Prior to CI-Madagascar's aid, many community associations' contracts had expired, in large part because they did not have the technical resources or knowledge of the process to lobby for themselves.[31]

Participation

Participation in Program Design

Furthermore, community participation in design provides them a greater role in the wider program management, which contributes toward the sustainability of the program once external managing agents are no longer present. As described by Corbera et al. and Hejnowicz et al. in the Best Practices section above, incorporating participation into program design is an important best practice. This can be seen in the CAZ Program in Madagascar, where the program design promotes the inclusion of community individuals and associations by actively involving them in consultation, management, and monitoring activities. It also provides capacity building to allow community members to increase their contribution over time.[32] These activities contribute to community independence from CI-Madagascar, giving Malagasies the tools to manage the work themselves.

Gender

Inclusive policies regarding gender equity and equality, while maintaining sensitivity towards the cultural norms of the areas in which forest incentives programs are being developed, were not found in the majority of the cases reviewed. Best practices on international development and economic policies have proven that the inclusion of women in social and economic programs is directly and positively correlated with increased economic success.[33] This lack of a specific emphasis on women's involvement in forest incentive programs was observed as a potential limiting factor.

One of the more difficult issues in program implementation that incorporates gender equality issues is how to do that where cultural barriers prohibit their formal participation. There is a very real danger/threat that violence against women can increase if issues are not addressed appropriately. Furthermore, if the communities do not accept or feel empowered with the processes in place, then they will likely not be adopted or could be a source or trigger for internal conflict. When incorporating gender equity and equality strategies, it is imperative that culturally specific forms of gender-based violence be considered in program design.[34] While the team did not see this in the literature specific to conservation incentives, the United Nations Development Fund for Women (UNIFEM) found that in a Mexican development program, domestic violence increased with women's sense of empowerment through participation.[35]

Charismatic Leadership

Finally, forest incentive programs are extremely complex and are usually developed over the long-term. Having the full commitment of diverse beneficiaries and stakeholders is a challenge without strong leadership. It was discovered that the involvement of charismatic and committed governmental leaders or community members was an enabling factor in forest incentives programs. The importance of charismatic and committed leaders was evident in the Heart of England Forest Program from the United Kingdom, where founder Felix Dennis was instrumental in conserving wide swaths of forested land in Warwickshire.[36]

Quality of Program Design and Implementation

Pilot Programs

Through our research we identified several programs that began with smaller pilot programs, specific to a community or a region. This was an enabling factor as it allowed the stakeholders to gauge the different factors that are involved in the program and determine which factors need to be altered in order for the program to be implemented on a larger scale. This can be seen in the Natural Forest Conservation Program (NFCP) in China, which began as a pilot study in 12 provinces and autonomous regions/ municipalities in 1998, and then was expanded to 18 in 2000 and continues to date.[37]

Organizational Structure and Inclusion

A number of studies, including Corbera et al. (2007), Kelman (2013), and Hejnowicz et al. (2014), have shown that multiple levels of organizational structure can be a limiting factor to the planning, implementation, monitoring, and overall effectiveness of a forest incentive program. Community stakeholders were more accepting to a more transparent and fewer multi-tiered programmatic structure. Decentralizing management structures requires a legal foundation and strong coordination, but also the trust of national government to harness local capacity. Doing so supports civic engagement and develops awareness of forest governance issues and the political process among forest-dwelling communities. In Madagascar, a national law was passed that formalized management transfers through legal contracts from the Ministry of Environment and Forestry to local community associations, referred to as "local management units" (LMUs).[38] Forest management by local communities draws on traditional knowledge and caters directly to the needs most relevant to local socioeconomic and governance support systems. Efforts are coordinated through a network of trained leaders and "relay communicators."[39] This system allows for both top-down initiatives to be consistently communicated as well as bottom-up concerns and interests to be addressed.

Communication

It is imperative to have a robust communications system to ensure forest protection program goals and updates are consistently communicated to local communities and that concerns of community members can reach program administrators. The flow of information can be significantly inhibited when telecommunications infrastructure simply has not reached rural program areas or if, for cultural or socioeconomic reasons, the community members have not adopted mobile communications technology.

The CAZ Protected Area in Madagascar addressed this limitation by establishing a network of "relay communicators" who are positioned in regional federations of community associations. They are trained on diverse subject matter surrounding the governance of the protected area and the purpose of conserving natural resources, and are locally present to inform forest managers and community members about the program.[40]

Effective communication and outreach programs that educate stakeholders on the connection between program incentives and the environmental services upon which they depend can make communities more amenable to change, and is also an important enabling factor. Another example of a best management practice in program community participation can be seen in the Conserving Biodiversity and Commercializing Non-Timber Forest Products project in Venezuela. This project, which was designed by Conservation International, worked with two NGOs, a company, and an intermediary firm, in addition to a community organization. Through a clear community engagement tool, all of the external organizations worked to train community members in improved capacity and production, which led to increased biodiversity and income for community members.[41]

Linking to Hydrological Resources

Finally, there are many forest incentive programs that are developed upstream in watersheds, due to an original goal of improving water quality and access to water for downstream users. Often these programs incorporate water use fees whose revenue is used to pay rural farmers and communities to reforest degraded forests or to maintain existing forest cover. This combination of fee collection through water use and an income generation component for forest managers in watersheds has been found to be an enabling factor.

These types of programs were observed in the Sao Paulo Water Fund case from Brazil, as well as the Mexico PSAH program. In the case of Brazil, over 20.1 million people live in the Sao Paulo region. The Sao Paulo Water Fund identified 14,300 hectares as priority areas for investments in forest conservation programs. This will lead to over $4 million in savings for the Brazilian government, by greatly reducing the cost of water purification from the minimized sedimentation rates.[42]

Monitoring

Transparency

Comprehensive information disclosure coupled with the monitoring activities of media, civil society, and watchdog organizations provide new perspectives to evaluate the effectiveness of a program's design and implementation. Third-party critical analysis is necessary to get a whole understanding of how a program affects all facets of the population.

While some information was found on programs that had conflicting reports on success, there was an absence of studies on incentive programs that were ultimately unsuccessful in reaching their program objectives. Lack of information regarding the varying components of programs that were unsuccessful in implementing conservation incentive programs limits the ability to share major lessons learned. Such information would be helpful in designing future incentive programs, particularly if they address the same beneficiary group or a similar on-the-ground context. The lack of this information could be because program evaluations are often conducted by program implementers who may be hesitant to report program failures and limitations. Hence, there is a greater need for transparency in program components so that lessons can be learned from them.

Adaptive Management

The regular review of program goals and methods of implementation, and the general use of adaptive management techniques can greatly increase the effectiveness of monitoring programs. Such structures allow for incorporating lessons learned and adjusting processes periodically for future implementation. If adjustment periods

are formalized, then monitoring and evaluation mechanisms can serve to better focus program over time. Inappropriate monitoring frequencies or methods can result in maladaptive programs. Kelman (2013) also acknowledged that lack of adaptive management can be a major pitfall for incentive programs. The benefits of incorporating adaptive management into monitoring procedures can be clearly seen in the Mexican National PSAH Program. Since the program began in 2003, it has undergone many changes, specifically of the criteria for enrollment within the program. Monitoring performed by external organizations identified several areas for improvement, such as lack of coverage for high risk deforestation areas and limited reached to highly impoverished communities. Subsequently, the PSAH Program was modified to include more marginalized communities and high-risk lands, thereby improving their performance in achieving these two objectives.[43]

Baseline Studies and Ongoing Monitoring

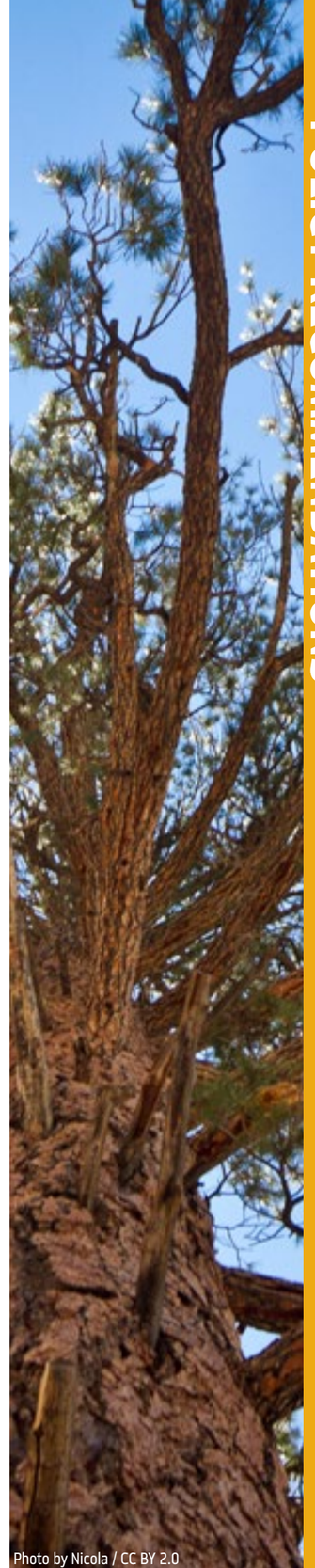
Monitoring and evaluating environmental and socio-economic impacts of conservation incentive mechanisms is hindered by a lack of existing baseline studies. While almost all programs have monitoring processes in place, none of the programs we surveyed in the database had baseline studies to allow for periodic impact evaluations. This is a significant limiting factor, as Pelletier and Goetz (2015) mentioned in their paper, since there is no benchmark to measure the impact of a given forest conservation incentive program. Alternatively, a number of programs incorporated ongoing environmental and socio-economic monitoring. The Indonesian HKm program has an innovative approach in building monitoring into the payment mechanism itself. The amount of cash payments made to farmers in exchange for reducing deforestation are based on the reduction of silt levels in a downstream hydroelectric dam. By linking the incentive program directly to observed impacts, monitoring capacity is made into an integral part of the conservation program itself, and helped to improve the ability of the program to reduce sedimentation, a major objective.[44]

An extensive literature review, analysis of 49 forest conservation incentive programs spanning five continents, as well as three in-depth case studies from Indonesia, Madagascar, and Mexico, highlighted a number of components, or best practices, of forest governance that best enable programs to reduce deforestation while building sustainable livelihoods. The following section contains recommendations for policy actions critical to the design and execution of forest conservation incentive schemes applicable in any country. Depending on the institutional role, the ideas presented in the recommendations may be applied by government agencies, international and local NGOs, transnational corporations, as well as advisory bodies at multilateral development banks and academic institutions, among others, toward the design of new incentive schemes or the annual review of current schemes. The recommendations are grouped around four themes, including: land tenure, community participation, program monitoring, incentive scheme design and implementation, as well as areas for further research. Expanding on existing international, national, and customary policy frameworks for forest management, we believe that implementing these recommendations will enhance good governance practices to more strongly advance incentives programs toward robust forest protection.

Land Tenure

Securing dependable access to forest land is critical for building sustainable livelihoods, maintaining cultural practices, and ensuring the commitment of local populations to conservation schemes for the long-term.

1. **Strengthen local systems for land dispute resolution** through, for example, mediation and enforcement mechanisms, to ensure landholders have security from third-party encroachment.
2. **Facilitate land tenure acquisition through legal or customary frameworks as a fundamental component** of all incentive schemes.
3. **Link land tenure acquisition with local management capacity building** to provide communities the ability to advocate for their own claims.



Participation

Community participation is integral to the implementation of forest conservation incentive programs. In addition to deriving multiple benefits, communities bring valuable knowledge of local conditions to design forest conservation programs that respond best to their needs. Community participation should be fostered at both the national and local level of governance.

1. **Comply with international treaties** such as the International Covenant on Civil and Political Rights; the International Covenant on Economic, Social and Cultural Rights; and the UN Declaration on the Rights of Indigenous Peoples, specifically their rights-based approaches to development; collective rights; as well as obtaining the free, prior, and informed consent of indigenous peoples.
2. **Develop a community engagement plan** in the initial program design phase, outlining stakeholder identification; outreach strategies; and procedures by which local communities will be involved in design, governance, management, implementation, and monitoring of program outcomes.
    a. Incorporate a strategy to increase gender inclusion over time at all levels of program implementation, including management.
    b. Include training and incentives to promote local community leadership and community capacity as a whole.
    c. Promote involvement of youth in all community activities in order to cultivate interest in forest conservation among younger generations.
3. **Prioritize early consultation with communities** during the program design phase to collectively assign authority, responsibilities, and grievance mechanisms.

Quality of Program Design and Implementation

Securing local community livelihoods, as well as strengthening institutional and financial sustainability, ensures that appropriate conservation incentives can effectively promote actions to counter deforestation and increase the efficiency of program implementation.

1. **Decouple payment schemes from fluctuating market mechanisms** (e.g. carbon markets) for conservation incentives.
2. **Adopt a multi-tiered approach to forest protection incentives wherever possible** to accommodate varying levels of participation among local populations. The approach may extend beyond strict conservation activities to promote local economic development, participation in forest governance, and sustainable agriculture bordering forestlands.
3. **Link incentives to poverty alleviation activities and capacity building** for beneficiaries.
4. **Establish explicit conservation goals and performance indicators** when developing forest protection incentives.
5. **Decentralize management structures** to promote leadership among local community groups and facilitate interaction at all levels of governance.
6. **Consider mechanisms to incentivize private sponsorship** to diversify funding sources and ensure long-term financial sustainability of the program, such as corporate social responsibility partnerships for community development funds, microfinancing, or opportunities for corporate promotion.
7. **Adjust conservation incentive frameworks or program design to incorporate other local programs' objectives;** for example, incorporating agricultural considerations into water fund programs.

Monitoring

Monitoring ensures effective implementation of forest protection programs over the long-term by providing a framework to evaluate performance indicators and benchmarks.

1. **Require environmental and social baseline assessments** prior to program implementation and compare future performance monitoring to these baselines in order to gauge progress toward program goals.
2. **Establish performance indicators** tailored to program goals as well as to local drivers of deforestation.
3. **Determine monitoring frequency and most effective method** of each performance indicator, e.g. on-the-ground or remote monitoring, and reporting frequency (monthly/quarterly/yearly); document reasoning behind these decisions in program design reports.
4. **Communicate the results** of the baseline studies, monitoring, and evaluation processes in communities to facilitate an adequate transfer of information so they may also benefit from the information being collected.
5. **Conduct annual surveys among community member** to assess program progress and address procedural inefficiencies.
6. **Conduct periodic reviews** of program objectives, management, and performance; incorporate feedback from periodic reports, annual surveys, grievance proceedings, and any other relevant data.
7. **Leverage academic (or other NGO) partnerships** wherever possible to conduct baseline assessments and monitoring activities.

Areas for Further Research

Further research in the following areas will help increase understanding of conservation incentive programs:

1. Ways in which incentive programs accommodate customary zoning practices, in particular around indigenous and rural peoples' stewardship of communal territories, and how customary zoning practices may be best incorporated within program management.
2. Monitoring and evaluating local social and environmental conditions after programs have ended and administrative organizations have left the area.
3. Ways in which intergovernmental exchange initiatives, e.g. South-South collaboration, influence policy design and implementation.
4. Surveying forest protection incentive programs deemed "unsuccessful" to draw out lessons learned for the benefit of future program design.
5. Given the long timeframe of many incentive programs (over 40 years for some), survey how program mechanisms target or support youth involvement and how that might contribute to sustainability of the program over time.
6. Survey which techniques most effectively enhance institutional memory in forestry management among small, rural communities (see point 5).
7. The extent to which gender inclusion enhances the effectiveness of conservation incentive programs, similar to the research performed on gender and microfinance programs.

CONCLUSION

Rising awareness of widespread deforestation and forest degradation has not always translated into sufficient on-the-ground mitigation measures. As a result, the livelihoods and wellbeing of local communities are increasingly threatened as the resources they depend on deteriorate and poverty levels rise. At the same time increasing greenhouse gas emissions levels exacerbate climate change, threatening all societies. Forest protection incentive programs developed in the wake of the Kyoto Protocol appeared promising, but in practice their outcomes have been varied. In response to an inquiry of WRI's Governance of Forests Initiative, the WRI Consulting Team focused in on which program design elements were most prevalent in enabling incentive schemes to both generate a net gain in forest cover while supporting the socioeconomic development of local communities.

The findings, drawn from over 50 scholarly articles, nearly 50 program snapshots, and three regional case studies, demonstrated a broad array of incentive programs in practice around the world. Whether the program offered direct payments to private landowners for maintaining primary ecosystem services or benefits to community associations for conducting conservation activities on communally held lands, various external factors influenced the implementation of such programs and the community's ability to reap sustainable benefits. To achieve both ends, the definition of land tenure proved critical to allow both parties (program designers and community members) a secure compensation agreement. Likewise, participatory approaches were instrumental in both achieving program objectives through community involvement as well as building support and education among community members. Adopting this type of a participation model fulfilled the diverse needs of participants, whether their objectives were more environmentally, culturally, or economically motivated. Finally, in an age where success is measured on quantitative data, expanding monitoring efforts of activities provided program managers the information needed to ensure objectives were being achieved and management practices were adjusted where they were not. Any combination of these approaches benefits programs' implementation through improved accountability of all actors involved.

Additionally, the WRI Consulting team identified a number of areas of outstanding research that could shine light on how specific program components, such as gender inclusion and the use of customary zoning frameworks, might enhance the outcomes of forest conservation incentive programs. The relatively recent development of these programs, however, is perhaps the greatest weakness to knowing with conviction, which mechanisms are ultimately the most effective at both protecting the world's forestland while balancing the needs of local communities for access and economic development. As programs mature and carbon markets expand, only time will tell which combination of efforts facilitate the most efficient use of resources to secure sustainable impact. In the meantime, building grassroots forest governance capacity will go far in linking local communities to their rights for self-determination and strengthen the relationship they have with the resources they depend on for generations to come.

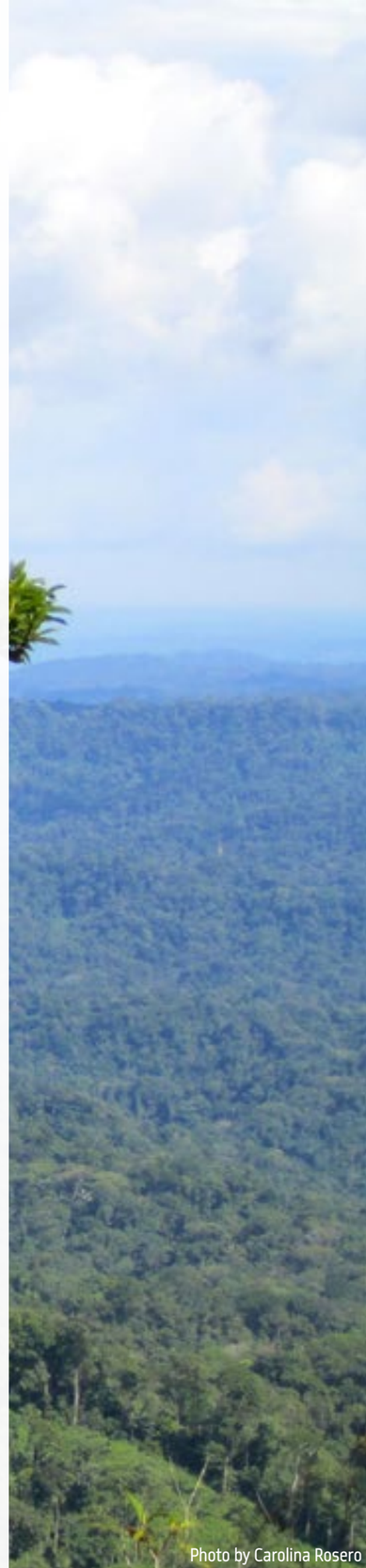


Photo by Carolina Rosero

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DEVELOPING POLICIES AND LEGAL FRAMEWORKS TO INCENTIVIZE FOREST PROTECTION

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CASE STUDY I

Hutan Kamasyarakatan in Sumber Jaya, Indonesia

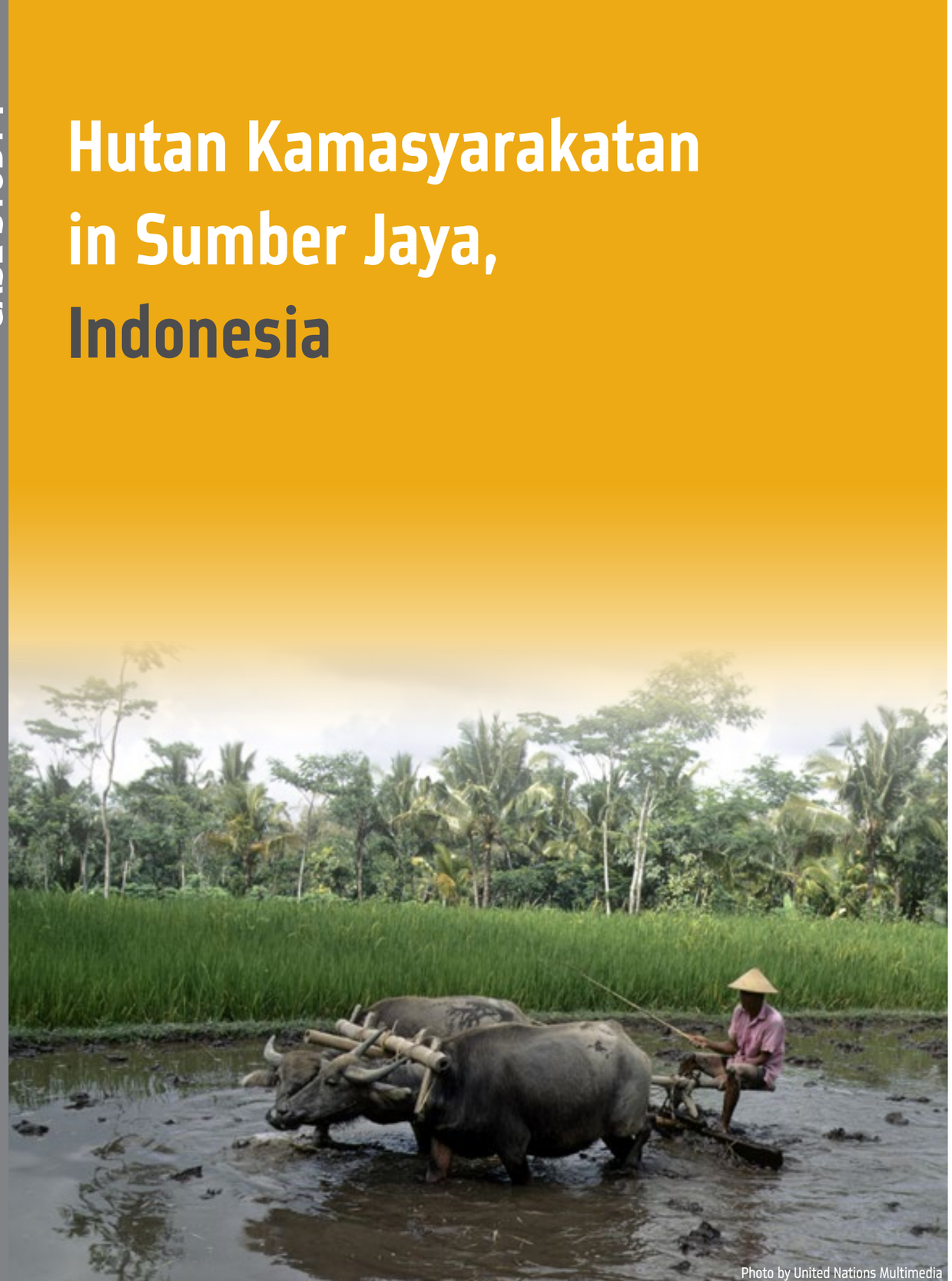

Photo by United Nations Multimedia

Name of Program | The Indonesian Community Forestry Programme or Hutan Kamasyarakatan (HKm) in Sumber Jaya
Implementation Area | Sumber Jaya, Indonesia
Implementation Period | Ongoing since 1998
Goals | Reduce sedimentation in downstream hydroelectric dam
Issues Addressed | Conservation and Protection of Natural Forests
Incentive Types | Land tenure and direct payments

Hutan Kamasyarakatan (HKm), the Indonesian Community Forestry Program began in 1998 to facilitate better conservation and management of forest lands. Historically owned by the government, the program seeks to give ownership and management rights to communities in exchange for specific conservation practices. The HKm program in Sumber Jaya is a PES scheme between upstream farmers and a state hydro-electric power plant, where incentives include land tenure as well as direct cash payments. This case study analyzes the successes and challenges of the scheme.

Introduction

Indonesia is ranked as one of the world's greatest biodiversity hotspots. Home to the third largest area of tropical rainforests in the world, rampant deforestation since the late 21st century has threatened the ecosystems of the region and put communities whose livelihoods depend on forests at risk. The current rate of deforestation is a controversial subject; with official statistics from the Ministry of Forests claiming it is about 450,000ha per year, while independent studies contest that the figure is at least twice that amount.[45]

Wide-scale destruction of the country's tropical rainforests has been a direct result of the shift in the Indonesian economy since the 1970s. Currently as one of the world's leading producers in palm oil and paper, Indonesia has given way to large-scale clearing of forests and illegal logging for monoculture industries. It has been estimated that more than 85 percent of the country's GHG emissions stem from such land use activities.[46]

Forest ownership laws and regulations in Indonesia are riddled with complexities. While the Indonesian government recognized the need for greater community participation for effective forest management in 1993, forests (whether publicly or privately owned) traditionally fell under the jurisdiction of the Indonesian Ministry of Forest.[47] This makes land tenure and property rights of forest dwellers a contentious issue, as there is a conflict of interest between the two parties. The government is perceived as being more interested in converting forests for production purposes, while local communities are concerned with social welfare and developing forests for their own livelihoods.

The Indonesian government classifies forests in 4 categories: conservation forests, protected forests, production forests, and customary forests that belong to indigenous communities. In the last few years, the government's de facto management of some customary forests led to many conflicts

with indigenous and traditional communities, who subsequently headed towards the court system for a settlement regarding full ownership of these forests.[48] In a landmark judgment of 2013, the Supreme Court of Indonesia amended the 1999 Forest Law, taking away millions of hectares of forestland from state ownership and giving the rights back to the indigenous groups.[49] Other issues regarding Indonesian forest ownership arise from demarcation of national parks for conservation purposes. As evidenced from cases around South and Southeast Asia, national parks that prohibit inhabitation of those forested areas give rise to a multitude of conflicts given that many populations reside within these forests. Historically, indigenous communities have been part of the forest or national park that they inhabit, making such regulations politically and socially risky.

Given the difficulties of forest management in the region and the threat of increasing deforestation, a number of schemes have been piloted in Indonesia, including several PES programs between government bodies, private players, international organizations, and local communities. In 2001, the Indonesian government started a program called Hutan Kamasyarakatan (HKm), or community forestry programs.[50] The objective of the program was to give rights to the local communities for social management of protected and production forests, as long as they abide by conservation measures enlisted by the government. This case study analyzes the HKm program in Sumber Jaya, mainly supported by the Indonesian government and a state hydroelectric power plant.

Geographic and Demographic Characteristics

Sumber Jaya is a 55,000 ha sub-district of the Lampung Province in Indonesia, located on the southern tip of Bukit Barisan mountain range in the island of Sumatra. These mountains traverse over 1,700 km from North to South on the west coast of the island, forming Sumatra's backbone, and include 35 active volcanoes.[51] The equator crosses the center of Sumatra, and thus, the island boasts a tropical climate that is hot and humid all year. Sumatra is also home to a wide range of flora and fauna, including 17 endemic genera of plants, 201 mammal species, 580 bird species, and 300 freshwater fish species. Some of these unique species include: Sumatran Tiger, Sumatran Orangutan, Sumatran Rhinoceros, Sumatran Elephant, Sunda Clouded Leopard, and the Sumatran Pine.[52] However, the island has lost almost half of its natural forest cover since 1985, critically endangering the aforementioned species. The island also includes 10 national parks, three of which are listed as a UNESCO World Heritage Site. About 40 percent of Sumber Jaya is classified as protection forests and about 10 percent are national parks. Currently, 70 percent of the total areas of Sumber Jaya are multi-strata coffee plantations.[53]

Sumber Jaya is considered one of the fastest developing regions of the Lampung Province. The region is a new commercial and population center and one of Lampung's most important "coffee pots," with smallholder agricultural production dominating Sumber Jaya.[54] Its population increased rapidly from 16,000 inhabitants in 1961, to 80,000 inhabitants in 2000, with a relatively high population density. This population includes groups of indigenous populations, as well as non-indigenous migrants: Semendonese from South Sumatra, Sudanese from West Java, and Javanese from Central and Eastern Java. Sumatra is the fourth populated island in the world, with more than 52 languages spoken.[55] This increase in population, combined with village development, agricultural production, and commercial activities during the past three decades transformed the region.

The Bukit Barisan mountain range creates the upper watersheds of all major rivers, where Sumber Jaya coincides with the Way Besay upper watershed between 720 m and 1900 m above sea level.[56] The conversion of forests to coffee plantations between 1973 and 2000 largely influenced watershed functioning. The Way Besay watershed feeds the Tulang Bawang River, one of the major rivers of the Lampung Province and Sumber Jaya. The watershed also supplies the PLTA Way Besay hydroelectric power plant constructed in the 1960s, which provides electricity to the Lampung and Riau provinces.[57]

Prior to the HKm program, there were conflicts that ensued between the upstream communities and other external stakeholders, such as the Forest Service, multiple levels of the government, and the hydroelectric power plant. Between 1991 and 1996, thousands of farmers of the Sumber Jaya forest were blamed for reduced water availability and thus, evicted by the government due to the perception that coffee farming near the watershed led to increased soil erosion.[58] This would further buildup sediments in the reservoir and decrease the water levels, which would be problematic for the operations of the Way Besay hydroelectric power plant.

Program Description

The program currently encompasses 70 percent of protected forests in Sumber Jaya and involves 6,400 farmers and 13,000 ha of forest area.[59] HKm has two overarching goals: promoting environmental conservation, and improving livelihoods and reducing poverty of the people living in the upper bounds of the watershed.[60] The program effectively does so by transferring the management of cultivated, state-owned protected forests to local communities, with the conditionality that they protect remaining forests, plant trees, and use multi-strata coffee gardens that would lead to watershed protection benefits.[61]

The HKm program is being carried out with local communities, a state hydroelectric power plant, along with International Center for Research in Agroforestry (ICRAF) through their Rewards for Use of and shared investment in Pro-poor Environmental Services (RUPES) program, as well as International Fund for Agricultural Development (IFAD). As part of this program, the government awards temporary land tenure every five years as a reward mechanism for forest conservation and watershed protection.

The scheme largely came into existence because of a downstream state hydroelectric power plant incurring losses due to sedimentation problems. Deforestation led to accumulation of silt levels in the dam due to soil erosion. Planting trees upstream was found to be an effective way to solve this issue.[62] Thus, the government developed a direct payments mechanisms with conditionality clauses. For reducing sedimentation up to 30 percent, a cash payment up to $2,200 is made or a 500W micro hydropower plant is established. For a 20 to 29 percent reduction, a cash payment of $850 is given, while for less than 10 percent reduction, an amount of $280 is given.[63]

In addition to providing secure land tenure rights, the program also aims to use agroforestry mechanisms to plant timber and fruit trees (400 trees per ha) and implement soil conversion measures. It further seeks to conserve and protect remaining natural forests through activities such as removing invasive species or protecting areas from logging and/or forest fires.[64]

In order to participate in the HKm program, communities must coordinate to submit a group proposal to the Forestry Department with the inclusion of the following information: a map of the proposed area, delineating areas to be conserved as natural forests and areas to be planted as multi-

strata coffee gardens; an inventory of existing trees; and a plan for planting additional trees. Once the individual projects are approved, a contract is drafted including information regarding the status and composition of the agroforestry plots to be maintained, as well as the soil and water conservation practices to be applied. Later, the program collects socioeconomic baseline data.[65]

In addition to the environmental and land management components, the program seeks to provide social benefits to marginalized groups. Communities and groups seek to become recognized as official residents in order to access government infrastructure like schools, roads, and agriculture and forestry extension services.[66] The process of applying as a group, in turn, requires incorporating and involving poorer groups in the project. These components of the conditional land tenure scheme and PES program are evaluated by analyzing information regarding institutional criteria, conservation performance and impact measured by social, economic and ecological indicators.[67]

Discussion

The Sumber Jaya HKm provides important lessons learned and successful program mechanisms in moving forward. The following section addresses four key components: land tenure, participation, quality of program design and implementation, and monitoring capacity. First, as land tenure proves to be a contentious issue in the region, the HKM program establishes a five-year contract for farmers and communities to legally access and use the land. Nonetheless, this provisional access to land does not resolve long-term land tenure issues in the protected area. Second, the HKm program demonstrates how effective community participation in program design can be successfully incorporated. However, high transaction costs might impede people from poorer groups from participating in the program. With regards to the quality of the program design and implementation, HKm appeared to be effective in helping to decrease water sedimentation, particularly because payments were based on the proven decrease in percentage of sedimentation. It further shows how agreements with public companies and beneficiaries can help decrease corruption and bureaucracy. Finally, the analysis of the research on the HKm program shows that while water forums can be an effective way of participatory monitoring of water sedimentation, a lack of institutional capacity can hinder program outcomes, with regard to decreasing deforestation rates.

Land Tenure

Sumber Jaya has historically witnessed numerous agrarian riots due to forcible evictions by government officials causing major distrust between communities and officials. In 1990, the Indonesian government classified some regions as “protection forests” in an attempt to limit deforestation rates. However, farmers and cultivators in these regions, including Sumber Jaya, were consequently seen as the culprits and perpetrators of growing deforestation. This resulted in thousands of farmers being evicted from their lands, in some instances even involving military interventions.[68] However, it was quickly realised that deforestation rates did not go down even though the forests were now managed by the government. Community participation and local support were identified as the key factors lacking in this approach.[69]

In 1998, conciliatory negotiations began between community groups and government officials and facilitated by local and international NGOs. This was done in order to communicate effects of land use change as well as bring local communities and farmers in the decision making process.[70] Since land tenure had been the most contested issue in the region, the HKm program sought to provide farmers with temporary land tenure in exchange for more environmentally friendly processes in farming techniques.

However, land tenure was only given temporarily, for five years. This poses a major challenge to the sustainability of the program, particularly because property rights remain a very contentious area in the Indonesian context. The only institution that can grant entitlements to forested lands is the National Land Agency, and this single agency is in charge of granting new tenures to communities across the country. Inadequate capacity and bureaucratic delays make the process of issuing land tenure difficult.[71] However, the Sumber Jaya HKm has managed to bypass this process since the body has the legal right to grant land tenure to projects under the Social Forestry Program. In spite of this, five years is not a sufficient amount of time to achieve adequate buy-in for the program. Land tenure had initially been granted on a first come first serve basis, and continuous migration and shifting demographic trends in the region will prove to be a contentious issue in the future. The region has witnessed a lot of migration from Western Java for decades, and the trend is likely to continue. Changing demographic trends and new populations moving into Sumber Jaya might pose serious threats to the current program.

Participation

As mentioned previously, the program currently involves 6,400 farmers.[72] The program was implemented after extensive consultations with community groups. Facilitated by RUPES, consultations with members of the communities and the state hydroelectric power plant were carried out for three years between 2004 and 2007 before implementation. Through these talks, security of land tenure and payments for reduced sedimentation to farmers were identified as the two main mechanisms for an effective program.[73] By participating and helping inform the program requirements, communities were directly involved in the program design process.

Local NGOs, like the River Care organisation and Watala, have been instrumental in effectively communicating program requirements and duties to communities, as well as helping write their proposals and making georeferenced maps. This help was critical in ensuring that a majority of farmers apply, given the long and complicated application process.

Unfortunately, it has been estimated that participating households spend up to half of their annual income to register for the scheme. Costs include application for permits, enforcement costs, and developing management plans. The application process is not only costly, but requirements, such as geo-referenced mapping of the area, can also be time consuming and beyond their technical capacity.

Quality of Program Design and Implementation

One of the major factors that contributed to the success of the program was the way in which it navigated complex fiscal arrangements that are the norm in environmental payment schemes in Indonesia. Considering that the program is a two-party agreement between the hydropower plant and upstream farmers, and payments are made directly to the farmers, fiscal reforms and additional local laws to legitimize the process were avoided.[74] As evidenced by other programs like the PES scheme in neighboring Lombok, payments made indirectly and requiring additional laws often result in failures because of how time consuming the processes is.[75] Even though the local government is a concerned party involved in granting land tenure to the program

participants, the payment process is strictly between the two parties. Further, the arrangement does not involve multiple stakeholders, making the functioning of the program a comparatively simpler process.

Some other challenges to effective functioning of the program have also been identified. Lack of effective communication of expectations has given rise to friction between government officials and farmers. Some farmers took participation in the program to mean a guarantee of no further evictions or destruction to their farms.[76] Local regulators, on the other hand, perceived the program as a tool to extend control over natural resources and participant communities.[77] Given the political history of the region and past experience of rioting and tensions in communities, this is especially problematic. Furthermore, lack of awareness about the specificity of the program has led some farmers to believe that the program gives rights to convert more forests into farmland.

While there are advantages to a restricted governmental role in the implementation of HKm, the result of this structure is less institutional capability and monitoring capacity to follow up on results and impacts of the program.

Monitoring Capacity

In order to monitor sedimentation rates, a Water Forum was established to facilitate communication between the communities, government agencies, NGOs and the hydroelectric power plant. Through this forum, six "Water Watch" groups were established in Sumber Jaya in order to measure water quality in the area. The groups conducted "action planning" in order to measure water quality through physical, chemical and biological aspects of water quality.[78] These combined activities aim to protect and improve the ecosystem services provided by the surrounding watershed, specifically in water flow regulation, erosion control and water quality.[79]

However, there have been certain challenges faced due to inadequate on the ground monitoring capacity of the program. For instance, some villagers are uncertain about how to meet certain program requirements for planting trees on their farmland. While willing to do so, there is little clarity about the number of trees, kind of trees, the species required, as well as who would supply the seeds. There are NGOs, like the River Care organization, that offer support in the initial stages of the program, including writing proposals; however, there are not enough systems in place to help villagers in the latter stages of the program.

Conclusions

- In the Indonesian context, PES programs with only two party arrangements between private players and communities seem to have worked. Multi-party agreements involving government bodies has proved to be less effective due to bureaucratic red tape, delay in tenure issuance, and, defining ecosystem services and property rights.

- The program has helped increase biodiversity in the region. Independent researchers have shown how in some cases, farmers have planted well more than the required 400 trees.[80] Since there is little baseline data to compare biodiversity levels, researchers have compared non-HKm regions with HKm cases and found more biodiversity in participant regions. Socioeconomic conditions too have by and large increased due to the extra income generation.[81]

- Going forward, the sustainability of the program will depend on how well the program responds to granting tenure for extended periods. If the current norm of five years land tenure is maintained, communities might become disillusioned about the process and not reapply and participate in the future. Since the application process for participating is a time and resource consuming process, efforts need to be made to identify model participants so that land tenure is granted for a longer period of time. This will build trust within communities, and ensure that long term conservation techniques are built in to the program, as well help develop a continuous monitoring mechanism to gather data on the effectiveness of the program.

Photo by United Nations Multimedia

CASE STUDY II

Ankeniheny-Zahamen Corridor Protected Area, Madagascar

Photo by United Nations Multimedia

Name of Program | Ankeniheny-Zahamena Corridor Protected Area
Implementation Area | The regions of Alaotra-Mangoro and Atsinanana, Madagascar
Implementation Period | Ongoing since 2005
Goals | Forest and biodiversity protection
Issues Addressed | Deforestation, Integrated Natural Resource Management, and Protected Area Governance
Incentive Types | Land management rights, carbon credits, and benefit packages for communities

Madagascar is renowned for its unique biodiversity and multitude of endemic species. However, this biodiversity is being threatened by the high rate of deforestation due to slash and burn practices and illegal logging. Consequently, the Government of Madagascar committed to augment the number of protected areas, one of them being the Ankeniheny-Zahamena Corridor, with the main goal of protecting threatened forests to preserve biodiversity. In order to protect the forests without diminishing the economic development of poor communities, whose incomes depend strictly on the natural resources, sustainable, forest-based incentive mechanisms were developed. These incentives complement forest protection with alternative sources of income generated through forest conservation. This case study examines the background, operations, management, and political conditions of the Ankeniheny-Zahamena Corridor. It also analyzes the benefits of co-managing the land with local communities and the use of a project design that is resilient to national political circumstances.

Introduction

Madagascar is considered one of the biodiversity hotspots of the world, but since the island was first inhabited 2,000 years ago, 80 percent of its forests have disappeared. Illegal logging for timber, fuelwood, and charcoal production; slash and burn agricultural practices; mineral extraction; and energy development continue to threaten its ecosystems and native species.[82] In the 2003 World Park Congress in Durban, South Africa, Madagascar's president committed to tripling the protected areas (PA) of the island, from 1.7 million to 6 million ha within five years, due to the high rates of biodiversity loss.[83]

By the end of 2005, more than one million more hectares were under national protection as a means to reduce deforestation and preserve Madagascar's unique biodiversity. This expansion incorporated the approximately 381,000 ha of land covered by the newly created Ankeniheny-Zahamena Corridor (CAZ, for its acronym in French), located in the east side of Madagascar in the province of Toamasina including the regions of Atsinanana and Alaotra-Mangoro.[84] The corridor hosts more than 2,000 species of plants, 85 percent of which are endemic to the island; 44 species of mammals, including 14 threatened species of lemurs; 129 species of amphibians; and 89 species of birds.[85]

Because of Madagascar's high poverty rates and the dependence of citizens on natural resources, the CAZ Protected Area developed four incentive programs through which local communities could receive

alternative incomes. These were created in order to halt slash and burn practices and illegal logging, to support communities economically, and to involve community members in forest conservation.

In recent years, Madagascar has experienced a level of political turmoil. There was a coup in 2009, which overthrew President Marc Ravalomanana, replacing him with Andry Rajoalina.[86] Because this transition of power was illegal, international institutions, such as the African Union and the South African Development Community, have still not recognized Rajoalina's authority. This has negatively affected international donations, which accounted for 40 percent of the Malagasy Government Budget and 75 percent of its investment.[87]

This case study will focus on the CAZ PA and the four incentive programs it encompasses, analyzing implications in terms of land tenure, partnership, project design, and monitoring.

Geographic and Demographic Characteristics

Madagascar is an island nation located in the Indian Ocean off the eastern coast of Africa. It has a total land area of 587,000 km2, 21.6 percent of which is forest cover.[88] Between 1990 and 2010, it had an average annual deforestation rate of 0.42 percent.[89]

Deforestation has caused substantial negative effects on biodiversity, leading to increased erosion. The loss of valuable topsoil has put the health of water systems around the country at risk. Erosion has impacted the water security of more than 325,000 residents across 21 communes surrounding the CAZ in addition to existing agricultural systems.[90] In 2005, these concerns led to the Government of Madagascar's declaration of the CAZ as a temporary protected area. At the time of this writing, the CAZ continues to undergo the process to be officially declared a protected area under the Malagasy Protected Areas Legislation (COAP, for its acronym in French).[91] This designation is equivalent to a category VI protected area under the International Union for Conservation of Nature (IUCN) classification system.[92]

Madagascar's social context impacts deforestation rates particularly because of high poverty rates and the population's dependence on farming and natural resource extraction for survival. In a study performed by the United Nations Development Program (UNDP), Madagascar ranked 143 out of 179 countries on the human-development index, and 107 out of 135 developing countries with regard to high poverty rates, with 87.7 percent of the population living under the poverty line in 2010.[93]

Under federal law, the Government of Madagascar is the primary landowner of all forestland, except for those that are on titled land.[94] Outside of forestland, citizens hold, on average, one hectare of land. The poorest citizens own an average of 0.5 ha, the wealthiest own an average of 1.8 ha, and 50 percent of the population has no legal land ownership.[95] Many farmers use slash and burn practices as a mechanism to claim land by a "right of axe." However, occupying the land without legal title leaves farmers unprotected against intruders.[96]

Madagascar has a pluralistic legal environment, which governs the land. A formal system of land tenure recognizes individual freehold tenure. In addition, there is a community-based customary land tenure system.[97] These systems are governed by national-level laws, as well as community-based rules and norms that regulate the community's access and use.

Project Description

Deforestation and exploitation has resulted in the creation of PAs to protect biodiversity. The Government of Madagascar, specifically the General Direction of Forests (DGF, for its acronym in French) of the Ministry of Environment, Ecology, Sea and Forests (MEENFM, for its acronym in French), together with Conservation International (CI-Madagascar), developed the CAZ PA. The CAZ PA comprises three pre-existing national parks and reserves: Zahamena National Park, Manongarivo Special Reserve, and Mantadia National Park.[98]

As shown in figure 9, the MEENFM manages the overall conservation corridor and makes all final decisions regarding the protected area through the protected area Manager, a position that CI-Madagascar has filled until a local manager is appointed.

The corridor is divided into six sectors, each one with a Sector Coordinator and a Local Management Unit (LMU). These positions are filled by local community members.[99]

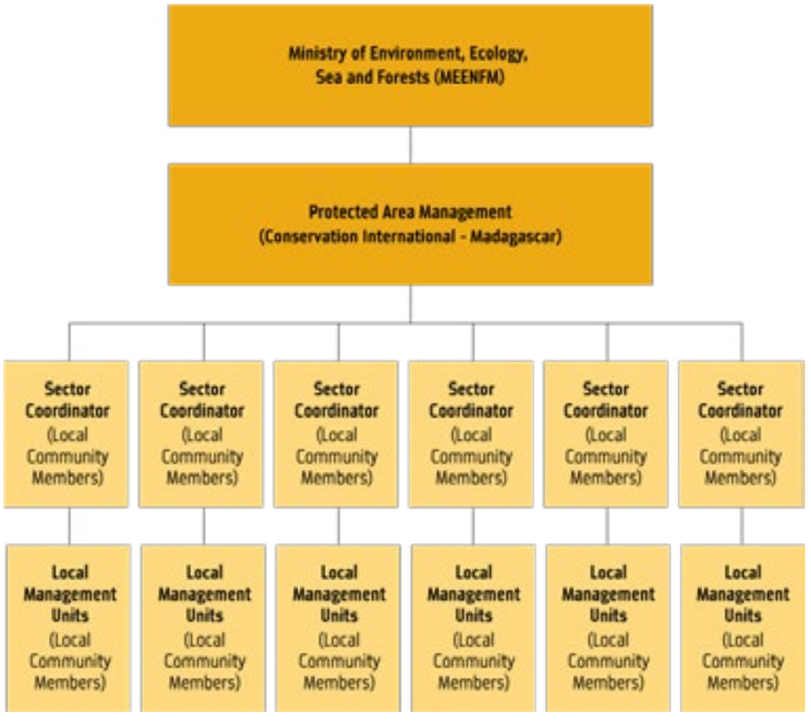

Figure 9: Organizational Chart of Madagascar's CAZ Protected Area

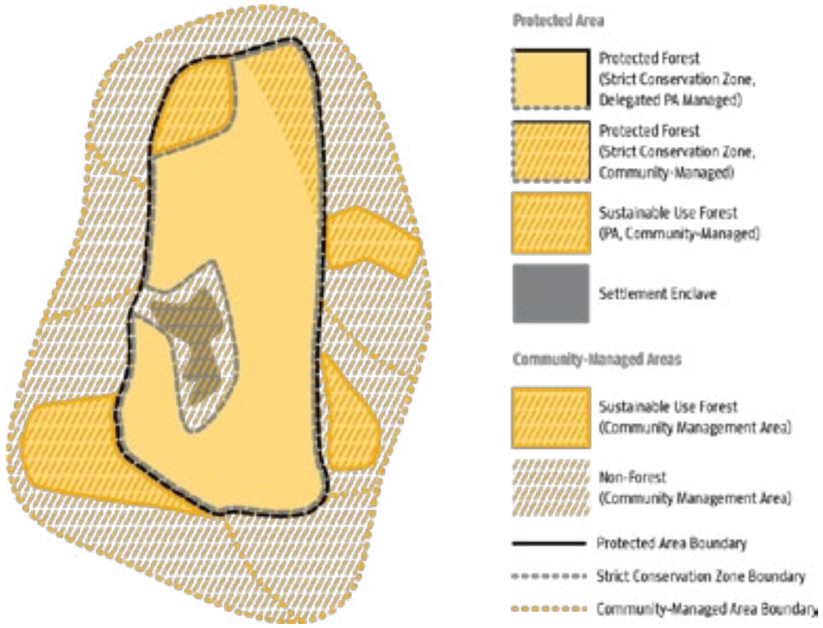

Figure 10: CAZ Protected Area Delineation of Land Use and Management Boundaries[101]

Through a zoning mechanism, the project and surrounding areas have four land-use zones: a strict conservation zone (234,165 ha); a buffer zone divided in a sustainable use forest area (112,316 ha) and settlement enclaves or leakage management areas (178,428 ha); managed forest areas contiguous to the protected area (23,552 ha); and non-forestland within two kilometers of project boundary, which contains another leakage management zone (45,942 ha).[100] Figure 10 shows a simplified map of the protected area land distribution.

The establishment of the CAZ PA sought three main objectives: unifying and creating a framework to protect the corridor as a whole; reducing deforestation and protecting biodiversity; and developing sustainable projects and programs that provide alternative income to the communities within the corridor.[102] To accomplish the second and third objectives, the project developed four incentive programs to provide local communities with alternative means to improve their livelihoods, while successfully managing the new protected area. These four incentive programs are: policies for transfert de gestion, or management transfer contracts; conservation agreements; the Node small grants program; and a REDD+ Carbon Credit Trade program. The carbon credit program works across the protected area, while the management transfer contracts apply in smaller territories within the protected area. The zoning of these territories include strict conservation zones, where community associations can apply for conservation agreements. Finally, the Node programs are implemented in the villages and agricultural lands surrounding the protected area, designated as non-forest community managed areas (Figure 10).

The first mechanism used in the CAZ PA, is a policy for transfert de gestion, or management transfer contracts, where management of natural resources is legally transferred from the government to community associations called Communauté de Base (COBAs, for its acronym in French), according to the zoning regulations of the protected area.[103] A COBA is an association of community members that can be appointed the right to manage the natural resources of a certain area and receive generated from that management. CI-Madagascar provides training to the COBAs in sustainable alternatives to slash and burn agricultural practices and hunting, such as forest restoration, improved rice irrigation, fish farming, and beekeeping. To date, there are 128 COBAs in the CAZ PA encompassing an average of 50 households per COBA, where each household averages six people.

Management transfer contracts are initially granted for three years, during which time the COBAs establish and log management goals with the Project Manager. Over the course of the contract, CI-Madagascar monitors the area according to the COBA's specified goals. At the end of the initial contract period, the MEENFM will conduct an evaluation of the contract. If the evaluation is positive, the COBA's management rights may be renewed for a longer period of ten years. If the evaluation is negative, the COBA's contract will be subject to reevaluation after another three years, contingent on their compliance of recommendations proposed by the Ministry, with the support of CI-Madagascar.[104]

Conservation agreements between CI-Madagascar and local communities provide the second source of income. The main goal of this mechanism is engaging communities in the preservation of natural resources by allocating a steady stream of incentives for conservation activities in the strict conservation zones under COBA management through negotiated benefit packages.[105] According to CI-Madagascar's 2008-2011 monitoring report, CI was working together with 13 communities under the conservation agreement program.[106]

The third mechanism, the Node small grants program is managed by CI-Madagascar and aims to boost local economies by providing grants to invest in the villages or agriculture lands surrounding the protected area. As a secondary goal, it helps increase the capacity of local NGOs such as the Association Nationale pour les Actions Environnementales and Malagasy teknisiana ho Andry sy.TEzan'i Zahamena ary ny Ala Antsinanana to administer and manage grants at a local scale.[107] Communities apply for these grants based on locally expressed needs and local NGOs administer and distribute the funds. Following allocation, NGOs provide community members the technical and organizational support and financial guidance they need to ensure the successful implementation of proposed activities.[108]

The fourth program is a REDD+ Carbon Credit Trade pilot program supported by the World Bank's BioCarbon Fund and verified by the Verified Carbon Standard (VCS). The program is designed to sell carbon credits for carbon sequestration on a voluntary market. The BioCarbon Fund will not

only provide initial financing, but also technical support to establish the program through VCS. The BioCarbon Fund will ultimately purchase the carbon credits supplied by the program.[109] CI-Madagascar serves as the main program developer, providing technical and financial support for implementation. CI-Madagascar will also responsible for monitoring of carbon sequestration levels to facilitate credit sales. It is important to note that this program has not yet been implemented.

The distribution of income generated from the carbon credit sales is as follows:

- 50 percent to the local populations/communities for community initiatives;
- 20 percent to the Forest administration to cover supervising, monitoring, and control activities;
- 20 percent to the Project Manager for management fees; and
- 10 percent for other fees.[110]

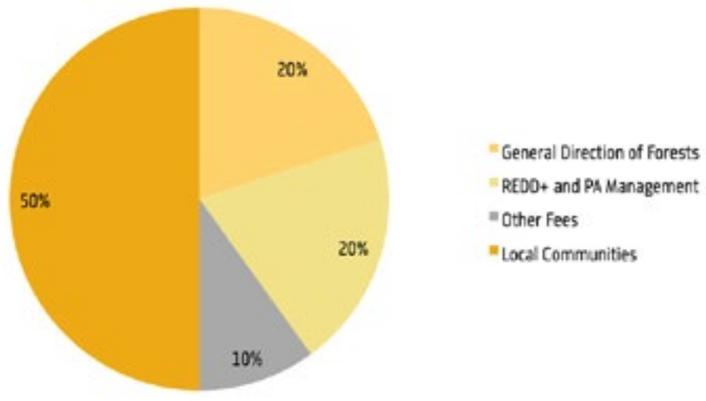

Figure 11: Carbon Credit Sale Distribution[111]

Besides Malagasy law, Madagascar has a more locally enforced accountability mechanism called dinan'ny mpanao hatsaka (dinas), which is an agreement developed by the government and local communities. This agreement, implemented by communities, prohibits slash and burn practices, dictates monetary penalties, and facilitates penal procedures.[112]

Discussion

The governance framework component of the project design reflects a number of principles, including bottom-up participation, capacity building, and coordination to drive sustainable impact. To better understand the context of the creation of the CAZ PA and the four incentive projects it encompasses, we analyzed its land tenure, partnership, project design, and monitoring systems.

Land Tenure

Land tenure is crucial in the project design, where granting individuals or communities with land titles facilitates the implementation of the different programs. This is especially relevant when political crises have been inhibitors in the development of income mechanisms as well as discouraging individuals' participation.

According to CI-Madagascar, land tenure is hard to obtain because it is an expensive process. In addition, the only office in the country that handles land titles is far away from the protected area.[116] Thus, the management transfer contracts program was legislated to confer temporary land rights to local communities. As a positive outcome, the management transfer allows COBAs to legally manage the land, gives them the right to expel intruders invading the property, and provides them with a legal tool to generate income. Because this arrangement provides only temporary control over the land rather than granting community members official ownership, it does not provide long-term land tenure security. As stated, the longest period contracts can be renewed is for a 10 year period. Such terms can disincentivize COBAs from investing fully in the land in the same way as if they had full ownership.

This lack of official land ownership, as well as political instability and bureaucracy, limit the implementation of international donor programs, such as the REDD+ Carbon Credit Trade program. For example, because the Government of Madagascar is the primary owner of forestland, it is entitled to funding from the World Bank. The Carbon Credit Trade program design establishes that the government should appoint a program administrator to manage the money. However, due to political crisis, the government has not yet complied, delaying the World Bank's budget allocation and blocking the implementation of the program.[117] Therefore, it would be beneficial to the sustainability of these programs to either implement a land ownership transfer program or appoint a non-governmental program administrator to manage such international funds.

Participation

An inclusive, participatory approach appears to build trust and open channels of communication among parties at the national, project, and local levels. These are all necessary factors for an effective long-term working relationship. At the ground level, the project is mainly characterized by a participatory and collaborative approach with local stakeholders. In 2004, the MEENFM began consultations with community groups throughout the region to gauge needs and concerns and to gather local perspectives on the project's design and boundaries. Consultations continued until the project transitioned to implementation in 2008. According to VCS documentation, the project received "unprecedented levels of stakeholder involvement."[113] Early and recurring interaction with stakeholders cultivated awareness of the project's plan and objectives at the local level. Communities' involvement in the management and monitoring of the project was and still is crucial for the project's success in addition to the Ministry's encouragement of their participation and contribution gave community members a sense of ownership of project outcomes.

Decentralization of forest management structures is an integral component of the CAZ PA project design. The project leveraged the 1996 community land tenure legislation, Gestion Locale des Ressources Naturelles Renouvelables, to promote the formation of management agreements between ground level LMUs and the Project Manager. While participation

in technical capacity trainings and the carbon trade component of the project are voluntary, management agreements formalize, in renewable Contrats de Transfert de Gestion, legal rights and access as well as the transfer of management responsibility to community associations. The 2012 VCS monitoring report intimated that the capacity building needed to execute these agreements is the responsibility of the Project Manager and local civil society organizations. Nevertheless, the level of the Project Manager's engagement may wane as these contracts enter into 10-year cycles. The role of the Project Manager in facilitating community involvement through legal and voluntary agreements strengthens cohesion between parties, which incentivizes all involved to work towards a common goal.

The Project Manager also facilitates the conservation agreements, which delineate conservation actions by community associations, within the scope of their management of the protected area. These management and conservation agreements provide a mechanism for the communities to collaboratively manage, or co-manage, the CAZ PA-- a new model for natural resource management being implemented in Madagascar. While the main obligations are carried by CI-Madagascar, the collaboration ensures a level of transparency and accountability between the local project and national government to uphold their respective responsibilities. Where these responsibilities are not met, grievance mechanisms are in place for community members to employ. Disputes are usually addressed locally at one of a number of committees-- management, conservation, or development-- depending on the issue. Local stakeholders are represented on these committees and have a role in decision-making. Each time a dispute arises, it is reported to the Project Manager and governmental authorities. Collectively, the management and conservation agreements provide communities with training in sustainable forest management and increase the project's long-term viability.

For forest governance to be effective in the CAZ PA, efficient coordination and communication are critical to mobilize the vast numbers of community managers involved. In addition, issues of capacity need to be addressed. Project-level staff organize LMUs into regional federations and creating, through partnerships, "relay communicators" who serve as focal points for a number of issues concerning the protected area. The VCS monitoring report noted that, "improving communications… is essential to our long term success and a major challenge in this remote area."[114] While these roles facilitate a more effective and informed exchange of dialogue between management units, the report also suggested that the lack of mobile communication adoption and connectivity in the region is a limiting factor.[115] Simultaneously, the training prominent local people builds their organizational and technical knowledge to allow them to later serve in new leadership and management capacities. These roles facilitate a more effective and informed exchange of dialogue between management units.

Participatory input and collaborative management approaches harness critical contributions of local communities needed over the long-term implementation of the project. The role of Project Managers in facilitating their involvement, by legal and voluntary agreements, also strengthened the relationship between stakeholders and the incentive to work towards a common goal. As the project advances in its seventh year of implementation, it may be too early to know how effective this framework will be on the project's ultimate performance; however, the careful consideration put toward designing the governance framework during consultations indicates that the project may be strongly positioned to deliver on its desired outcomes and, over time, prove to be a successful governance model upon which other projects could be replicated.

Quality of Project Design and Implementation

Because political instability in Madagascar has produced inertia in implementing programs, it would be best if its duties could be redirected to civil society entities. While this option presents risks, such as an NGO's lack of funding or under-qualified staff, removing the government from this critical role gives programs independence and stability. Such a transfer of responsibility requires capacity support, such as an NGO specializing in finance or a program providing suitable training to staff.

Even though the project design includes different alternatives to generate income it could be argued that COBAs' and communities' well-being can be limited due to protected area preservation priorities. Even though the project's objective is preservation, it is well understood that poverty is one of the main drivers, so in order to reduce deforestation the project should guarantee that conservation practices will not impede the ability of rural communities to develop economically. If there are too many restrictions on the lands that they are given right to manage, it is hard for communities to actually gain an economic benefit, resulting in conservation at the expense of community development, risking long-term project sustainability. Protected area zoning the incorporation of an emphasis in sustainable production-oriented management contracts rather than protectionism has been the first step, but there is still work to be done in relation to recompense communities' efforts for conservation.[118]

Conservation objectives eclipsed community development in the failure to implement conservation agreements where monetary incentives were not high enough to incentivize the communities to perform conservation activities. To overcome this problem, CI-Madagascar decided to unify the conservation agreements under the Node program. In contrast to conservation agreements, the Node program has been attractive to the communities because incentives directly improve livelihoods (i.e. better yields, new schools). The new design required participants to sign a conservation agreement in partnership with their involvement in the Node program.[119]

Another challenge in the design of the project is the inclusion of women's rights. Even though there is no official obligation regarding gender in the project design, CI-Madagascar affirms that women are increasingly asked to perform roles with greater responsibility, such as money handling in the COBAs. If women's rights are not formally incorporated into the design then there are no accountability measures linked to those obligations. Culturally, in Madagascar, women do not have authority to speak in public and their participation can only be made possible through their husbands, which inhibits women's contribution and voice in the design and implementation of the project.[120] CI-Madagascar is presently working on a new strategy to better include gender rights into the project design to formally address women's responsibilities and participation in the communities.[121]

Communities' increased awareness of and involvement in the project's deforestation reduction goals can be stated as a foremost success of the project. In addition, providing communities with training opportunities as well as options for alternative income generation activities not only advanced environmental protection objectives but also sustainable economic and social development.[122] As part of the project, the community receives 50 percent of the protected area's revenues from

carbon funds, training on monitoring performance as a part of the conservation agreements, training and skill development as a part of the management transfer contracts, as well as training in infrastructure and sustainable agriculture as part of the Node program.[123]

Monitoring Capacity

Monitoring imposes one of the biggest challenges of the project. Studies suggest numerous positive effects of the project, such as deforestation rates four times higher outside Malagasy protected areas, or the reduction of slash and burn practices, and improvements in the diversity loss index. However, there is no official documentation or reports of any of these indicators available to the public. This greatly reduces the transparency of the project.[124]

As part of monitoring design for management transfer contracts, CI-Madagascar analyzes yearly capitalization reports of COBA's managerial performance based on communities' own stated goals and commitments. Contract reports work with dichotomous indicators--done and not done--rather than quantitative indicators, making it difficult to measure the overall achievements of the project's deforestation and community development objectives.[125]

Conservation agreements have a different monitoring process whereby community members are trained to monitor and document, with the aid of cameras and GPS tools, the presence of endangered species in the CAZ PA. However, even if they can confirm the presence of species, they cannot confirm precise abundance. Since January 2015, the project started registering their information through the spatial and monitoring tool (SMART), to analyze incoming data and create a database for conservation monitoring with the main objective of sharing this information with all stakeholders. Monitoring data gathered by community patrollers is compiled into this database and they can use this information to monitor deforestation and conservation in real time. It is the expected that the implementation of this new tool will help CI-Madagascar and the community to effectively monitor the improvements and effectiveness of the project over the protected area, as well as empowering the communities to see the effectiveness and relevance of the project.

Because of poverty in the area, monitoring slash and burn reduction and accountability in the protected area poses a great challenge. The fact that the patrollers controlling slash and burn usually know the offenders, who the majority of the time conduct such practices in order to to feed their families, patrollers end up not reporting the incident making the process unreliable.[126] This is making it hard, on one hand, to hold people responsible for doing illegal agriculture and, on the other hand, to measure the reduction of slash and burn practices. The price of the fine raises another issue. In many cases, offenders are too poor to afford to pay the fine. Since 2010, only 2 arrests and 8 applications of the dina have been performed.[127] As a way of improving monitoring techniques, the project design should include a neutral counterpart in the monitoring strategy. Disinterested third parties are better suited to enforce penalties as well as aligning the fine's cost to be more commensurate with the economic reality on the ground.

A principal issue related to monitoring and measuring the impacts of the project on community development concerns measuring poverty alleviation. Due to land tenure stipulations in the project, only people belonging to COBAs are able to receive the incentives. However the population represented in COBAs are not the majority. Drawing from statistics stated in the description, the COBAs cover a population of only 38,000 people out of the area's 325,000 residents.[128] Therefore project impacts on income levels are hard to measure because as they do not encompass all the residents. For this reason, the project has to secure higher participation rates in order to evaluate economic impacts that are truly representative of the population.

In conjunction with local authorities, COBAs and communities could improve enforcement to hold slash and burn offenders accountable. Furthermore, Project Managers could increase community outreach to improve economic monitoring and develop transparent and efficient data collection to better measure the performance of the project over time.

Conclusions

- Needs of the communities must be appropriately addressed.[129] Training the community in sustainable forest practices and alternative income generation methods as well as educating community members about the importance of forest conservation is vital to accomplish the project's deforestation and biodiversity goals. Overall, the main successes of the project has been the ability to involve local communities in conservation activities and to instill awareness of sustainable ecosystem services.

- Co-management strategies and facilitating land right transfers have reinforced community responsibilities and increased community members' income generation.

- The CAZ PA needs to continue working towards land ownership acquisition to the communities by decreasing costs and facilitating access to services by opening offices closer to the communities.

- Transfer the CAZ PA project management from the government to a local NGO to ensure the program's stability and independence from political conflicts.

- A holistic approach to forest protection, including different land-use zones across the various programs, provides communities with options for levels of participation.

- The project must develop monitoring and reporting systems that facilitate data collection and information transparency.

- The CAZ PA should expand its community outreach to broaden its beneficiary base, advance conservation goals, and facilitate broader economic development throughout the region.

CASE STUDY III

National Payment for Hydrological Services Program, Mexico

Photo by United Nations Multimedia

Name of Program | Mexican National Payment for Hydrological Services Program (PSAH)
Implementation Area | Mexico
Implementation Period | Ongoing since 2003
Goals | Protection of watersheds through forest conservation and reforestation
Issues Addressed | Deforestation, Aquifer Exploitation, Poverty, Gender Rights
Incentive Types | Direct Payment

In 2003, the Mexican National Forestry Commission (CONFOR) implemented the Mexican National Payment for Hydrological Services Program (PSAH, for its acronym in Spanish), a countrywide program that aims to use earmarked funds from water use fees to curb deforestation and increase conservation of forest cover in order to protect aquifer recharge in priority areas. The program also seeks to maintain rural income and reduce poverty through direct transfers to landowners in exchange for maintenance of forest cover. As the largest program of its kind in Latin America, the PSAH program has a sustainable source of funding through fees on water usage and has had a great impact on the country's population. The successes of the program have been mixed, with minimal reduction to deforestation rates, largely due to the fact that enrolled lands had a low or very low risk of deforestation, but also provide greater added income to some participants than they would have generated through agriculture and other practices.

Introduction

Mexico is ranked as one of the world's most biologically diverse countries. Housing approximately 64.49 million ha of forest, Mexico has continued to struggle with rising deforestation rates over the past decade, seeing 6.18 million ha of forests lost between 1993 and 2007.[130] The drivers of deforestation in Mexico are similar to trends across Latin America: agricultural expansion, habitat conversion for cattle pasture, colonization, and commercial and illegal extraction of timber and non-timber forest products (NTFPs).[131]

Since the mid-20th century, agrarian laws in Mexico have remained relatively stable, while forestry laws over the past three decades have fluctuated dramatically due to the changing policy regimes and governments with conflicting forest agendas. However, throughout the 1980s, there was a strong movement in Mexico to promote good governance and improved participatory forest management. This was in part due to the previous centralized policies that favored large and damaging forestry concessions managed by the national government, some of which overlapped with community lands without their consent. The passing of the Forestry Law in 1986 ushered in a period of greater community involvement and agency, while also limiting governmental control of timber rights and the concessions they managed.

This was followed by important changes to the Mexican Constitution and the National Agrarian Law, which provided greater land tenure security for individuals, "comunidades," and "ejidos."[132] Stemming from the Agrarian Law, "comunidades" refers to indigenous communities with historical

land occupation, while "ejidos" refers to a community that is collectively cultivating land distributed through the agrarian reform process prior to changes in the 1980s. Ultimately, the Mexican government retained ownership over the lands, though these communities, which refer collectively to both groups (comunidades and ejidos), were granted substantial rights in terms of occupation and governance.[133] It is now estimated that approximately 80 percent of Mexico's forests fall within the lands of these communities.[134] More recently, in 2001 a presidential decree created the CONAFOR. CONAFOR's mandate is to develop, encourage, and promote productive conservation activities, as well as forestry restoration, for the implementation of sustainable forestry development as a means for both economic growth and social development.[135] CONAFOR's creation marked a new phase of support for forestry in Mexico.

In early 2003, a number of Mexican municipalities concerned with declining water availability began developing local PES programs. A small pilot program in the Coatepec municipality, where water users paid a minor fee to a public trust to improve the state of the area's reservoirs, proved successful and ultimately became the trial platform for the broader nationwide program. The Coatepec program, in combination with the input and guidance from the Costa Rican national PES program and a national desire to address the urgent water scarcity crisis, paved the way for Mexico's national PES program.[136] Furthermore, given that Mexico has a 52.3 percent poverty rate, with a significant overlap between the impoverished communities and forested areas, the PES schemes incorporated social components to the program.[137] Hence, the PES schemes aim to provide increased income to impoverished communities, whose other livelihood opportunities are limited, while simultaneously conserving forests.[138]

Thus, to address rising deforestation and water scarcity at the national level, while taking into consideration the social context of the poor communities, CONAFOR and the Environment and Natural Resources Ministry developed the Mexican national PSAH. The University of California at Berkeley, the Costa Rican National Forestry Fund, the Mexican National Institute of Ecology, and a variety of stakeholder groups representing civil society and ecosystem user groups provided additional input on the design.[139, 140] CONAFOR manages the PSAH program as part of a two-pronged PES program: the PSAH program and the Payments for Biodiversity and Carbon Captures Services program (PSAB, for its acronym in Spanish). However, this case study will focus only on PSAH, considering the scale and the limited information available regarding the PSAB Program.

Geographic and Demographic Characteristics

Mexico has a population of over 120 million and is rapidly growing. Its forest cover, however, has steadily been shrinking due to the continuous development of its cropland. In 2012, the United Nations Food and Agriculture Organization (FAO) reported that the forest cover was 64.49 million ha; a 1.79 million ha decrease from 2002 levels.[141] Mexico hosts a wide range of forests: rainforests cover 49.4 percent of the forested area, temperate forests make up 47.9 percent, and cloud forests 2.6 percent.[142] The cloud forests, located in the central zone of Veracruz, not only sustain a great deal of biodiversity, but they also capture, hold, and recirculate water from low-lying clouds, thus supporting and maintaining the hydrological cycle. Considering that Mexico suffers from water scarcity issues, hydrological services provide important resources and benefits for the population. However, growth in agriculture and cattle farming has significantly decreased cloud forest cover and contributed to a decline in the quality of environmental conditions by contaminating the water and causing soil erosion.

Historically, much of the population and agricultural production in Mexico have been concentrated in the northern portion of the nation. This particular part of the country has the least amount of water resources available and is facing increasingly severe water shortages.[143, 144] Furthermore, water resources in Mexico are unequally distributed; 28 percent of the renewable water is found in regions that contribute 77 percent of Mexico's GDP and contain 68 percent of the population.[145] Mexico's water stress issues can be traced back to the 1930's, when the ejidos were created. Ejidos attempted to improve the socioeconomic status of poor rural farmers, but subsequently led to aquifer depletion through excessive groundwater pumping. This problem was exacerbated in the coming decades during the Green Revolution, when technology transfers and financial aid were provided to Mexico and agricultural production increased even further.[146] As noted in the table below, agriculture has been and remains Mexico's most water-intensive industry.

Mexico: Freshwater Utilization				
	Volume per year (km3)			
	1996	2001	2006	2001
Agriculture	62.50	56.10	60.57	61.20
Domestic	n.a.	9.60	11.16	11.20
Industrial	n.a.	6.90	7.22	7.40
Total	n.a.	72.60	78.95	79.80

Figure 11: Mexico's Freshwater Utilization[147]
Table of Mexico's freshwater use across three sectors: agriculture, domestic, and industry.

Northern Mexico is not alone in its water scarcity problems. Increasingly more Mexican cities and towns struggle to provide water to their citizens; in fact, two-thirds of the country's aquifers are classified as overexploited.[148, 149] Faced with worsening droughts and other severe weather conditions due to climate change, reducing water scarcity is a top concern for the Mexican government.[150, 151] Moreover, these crises sparked greater awareness of the critical role that forests play in preserving water quantity and quality through natural recharge of underlying aquifers.

Program Description

The PSAH program is one of the first and largest national-level efforts to implement a PES program.[152] The two main objectives of the program are to preserve and increase forest cover in order to sustain hydrological services, and maintain rural income and reduce poverty. Though originally the primary focus of the program was conservation, increasing social pressure compelled the government to place greater emphasis on reaching marginalized communities.[153] The program's funding is derived from earmarked water fees across the country, which is given to

local communities or individual landholders through direct transfers. The program prioritizes tropical rainforests and cloud forests.

Private and communal landowners applying to the program were ultimately chosen by the government through a variety of considerations. The major requirement was that their land needed to be in watershed areas that had been identified as having poor water quality or water scarcity, which included being located: in mountain areas, by aquifers that were being rapidly diminished, or in watersheds that supplied urban centers of more than 5,000 people. Private or communal landholders with plots that have forest cover of at least 80 percent may participate in the program. The smallest eligible size for participation in the program is 50 ha, as that is the smallest site that is still visible via satellite images.

Although the project was national, efforts were concentrated between Chihuahua and Durango in the northern region, and Oaxaca and Chiapas in the southern region of the country. The program faced some issues in the first few years, but following a review, it has aimed to improve on incorporating areas of greater conservation concern (with higher risk of deforestation) and more marginalized communities. The Mexican government aimed to revitalize threatened aquifers by protecting forested land through the establishment of five-year contracts signed with its participants. Between 2003 and 2011, the PSAH program encompassed 2.4 million ha and disbursed US $384.6 million.[154, 155]

In order to finance the program, downstream consumers pay a water use fee to the national government. Although all citizens in Mexico pay for their water, rates vary on a state-by-state basis. However, farmers, the largest water consumers, are not charged water use fees. The program uses a portion of the fees gathered to pay participating individuals or communities through direct money transfers of approximately $27 per ha annually. Landowners in cloud forests receive a premium payment of $36 per ha annually because of the stronger capacity of cloud forests to capture water during the dry season. Landowners and communities receive approximately 96 percent of the payments directly, while the remaining four percent cover the social benefits and program costs.

Since the program's inception, CONAFOR has managed a total budget of approximately US $450 million.[156] Although the objectives of the program don't include gender rights issues, the selection criteria for projects incorporates them by prioritizing applications submitted by women for enrollment. Through ongoing socioeconomic and forest monitoring, the program aims to track the long-term effects of the project on forests and targeted populations.[157]

Discussion

The PSAH project has had mixed success due to various social, economic, and political factors. One such factor is land tenure; because of numerous land reforms and the establishment of ejidos and comunidades, which is where most of the members of the program reside, there are established property rights within these communities. Participation in the PSAH program is contingent on holding these property rights, and ejidos were formed to grant poor populations land rights and close the gap in land tenure. In addition, the success of the program hinges on CONAFOR's ability to engage in outreach and draw participants, especially those living in high-risk areas, because the PSAH program is voluntary. The ability to reach future participants is contingent on feedback from current participants. This feedback, along with that of the program managers, environmental non-profits, and academics guide the future of the program. The implementation of the PSAH is hindered by the lack of established national selection standards for applications, however through the process of adaptive management, the program is improved and updated based on stakeholder reviews. The analysis of the PSAH program has shown that linking water resource management, poverty alleviation, and other environmental and social concerns to forest conservation can be an effective approach towards protecting forested land.

Land Tenure

Because applicants cannot participate if they do not hold property rights, land tenure is a crucial component of the PSAH program. Mexico saw sweeping land reform after the revolution in 1917; over 100 million ha from large farms were distributed to groups of households arranged into ejidos.[158] Indigenous groups also received the rights to their commonly held land and organized it into comunidades.[159] This land regime changed in 1992; the laws barred any future expansion of communal lands, so no new ejidos could be created, and the government also allowed privatization and market transfers of ejidal property rights. These changes, however, did not address the inadequate protection of women's land rights, and poor state participation in the land certification and registration process.[160] Women have mostly been left out of land redistribution programs, they are usually not voting members of ejidos and men hold the majority of ejidal land. It is important to note this because the PSAH program gives priority to women applicants, but it is difficult for a woman to hold land tenure because they seldom have formal authority within ejido communities.

Over half of the members of the PSAH program live in collectively held and governed areas; this includes the comunidades and ejidos. Comunidades are legally recognized by the state and are formed by indigenous groups who were granted land tenure. The development of comunidades has been slow and the collective owners tend to be poor. The ejidos are also legally recognized by the state, and land tenure and governance rights are granted to a collection of authorized households, who become members of the ejidos, by the government in order to address the issue of land tenure inequality. There are two types of property rights within ejidos: private parcels and commons.[161] The private parcels are predominantly used for agriculture, while commons are reserved for pastures and forests. Individuals who are not members of the ejido also live in the communities; they are usually the progeny of members who were not able to gain membership because of legal restrictions that limit inheritance of the land to one child.[162] These non-members do not have land or voting rights, but they often farm lands that have been abandoned or take land illegally from the commons.[163] This may pose a problem for the PSAH program because forested land that is supposed to be maintained may be illicitly farmed. The documents necessary to prove land ownership also presents an important constraint for communities to participate in the program. This is further hindered due to the lack of NGOs or other organizations to facilitate the process. CONAFOR should enlist the assistance of NGOs in order to engage more participants and communities.

Participation

Although there has been a concentrated effort to engage the beneficiaries of the communities, they have not been involved in the design, monitoring or reviews of the PSAH. In 2001, Mexico included transparency laws that required all government agencies to share program policy design and implementation data. With that legal framework in place, CONAFOR is required by law to carry out annual external evaluations, which are performed by universities and consultants.[164] The inclusion of multiple stakeholders in the regular review process not only contributed to more comprehensive feedback, but also ensured sustained attention towards the program. By legally mandating this review process, the project has been able to successfully evaluate what is and is not working in order to make comprehensive changes fairly quickly. This is a process that should be considered for replication in other cases.

In line with the mandate, after the PSAH began in 2003, a variety of stakeholders, both inside and outside of CONAFOR, performed yearly program evaluations with the main goal of revising the application selection process. These reviews, which were made by program administrators, environmental non-profits, and academics, provided valuable information in making changes to application requirements, which can be seen in Figure 12. These changes have included minimum

Eligibility and Selection Criteria for Mexico's Payments for Hydrological Services Program, 2004-2010

	2004	2005	2006	2007	2008	2009	2010
Geographic Selection Criteria							
Located in overexploited aquifer	◆	◆	■	■	■	■	■
Within zones related to water provision for urban centers with population >5,000 or within boundaries of priority mountains	◆	◆	■	■	■	■	■
Within an area of high surface water scarcity			■	■	■	■	■
Within a protected natural area			■	■	■	■	■
Within area of high risk deforestation			■	■	■	■	■
Area contains high biomass density						■	■
Area has low rate of anthropogenic soil degradation						■	■
Participant Selection Criteria							
No active legal battle over enrolled land	◆	◆	◆	◆	◆	◆	◆
Highest % of forest cover	■	■	■	■	■	■	■
Not enrolled in any other PES programs			◆	◆	◆	◆	◆
Applicant has a forest management plan			■	■	■	■	■
Applicant in municipality with majority indigenous population			■	■	■	■	■
Applicant from areas with high municipal poverty			■	■	■	■	■
Applicant is a woman					■	■	■
Applicant has pending contract with an ecosystem service buyer			■	■	■	■	■
Applicant submits with other owners whose lands are adjacent				■	■	■	■
Applicant is in a watershed where there are others with local payments for environmental services							■
Land requirements							
Land area (ha)	50-400		20-300			100-200 /individual; 200-3000 / community	
Forest cover (%)	80		50				

Symbols: ◆ = requirement for eligibility; ■ = criteria for points system establishing selection priority for enrollment within eligible applicants

Figure 12: Eligibility and Selection Criteria for Mexico's PSAH Program[166]
Table depicting the changes in the eligibility and selection criteria of Mexico's Payments for Hydrological Services program from 2004 to 2010.

forest cover requires, which resulted in higher quality forests being conserved over time.[165] However, the external review process could have been strengthened greatly with the inclusion of the project beneficiaries in the ongoing feedback.

Although the PSAH program was not originally intended to be a poverty alleviation program, lobbying by NGOs and greater World Bank involvement resulted in incorporation of such goals and objectives. The impetus for this inclusion was because much of Mexico's forests are located in territories where marginalized communities are located. However, it is important to note that the NGOs were lobbying on behalf of the program beneficiaries, though it is unclear if the beneficiaries requested such representation. This is yet another point in the life of the PSAH program where beneficiaries were not actively participating and representing themselves. Though the NGOs and the World Bank were acting in what they thought was the beneficiaries' best interest, allowing opportunity for these essential stakeholders to lobby on their own behalf is also critical.[167]

It is important to note that the high demand for participation in the program may be due to the fact that conditions for farming and ranching do not exist in much of the forestland. Hence, the payment offered through the program surpasses the opportunity cost of farming or ranching on the land. However, because the PSAH program is voluntary, one can infer that improved communication of program benefits and goals could result in increased enrollment through more consistent messaging and augmented efforts to reach isolated or marginalized communities. A series of field studies observed very little recognition of the broader goals of the PSAH and the connection between payments and environmental services, suggesting that there is much room for improvement in this regard.[168] If the importance of the program can be emphasized to local communities, they might be more motivated to conserve land with higher opportunity costs. This can be done through partnership with NGOs and workshops held by the government in order to educate those with property rights about the value of their land and sustainable management.

Quality of Program Design and Implementation

In analyzing the program's prioritization, a challenge arises because Mexico has not established a national selection standards have not been appropriately set. A lack of transparency in selecting priority areas for the program limits its effectiveness because Mexico's geographic and environmental conditions vary greatly. Some areas are under high deforestation risk but have low water scarcity, while other areas face low deforestation risks but high water scarcity. This is a difficult issue to tackle because if this program favors particular states, securing funds through the national annual budget negotiation can become difficult.[169] This is an important political economy constraint that hinders the success of the program. While the financial sustainability of the program is established through earmarked water fees in the general budget, the program's budget must be negotiated and voted on every year by congress. This, in turn, impedes changes or adjustments in the program's budget allocation.[170] This affects the program's ability to realize its overall goals, and introduces political pressure that can influence which areas are included in the program. Areas that are not necessarily relevant will be included in eligibility zones due to political pressure and bureaucracy at the national level. This may have the effect of diluting funding, and areas that are of high significance may not get the attention they deserve.

One of the greatest strengths of the program is that it has engaged in adaptive management and incorporated feedback from stakeholders in order to have a greater impact and reach its goals. Annual re-evaluation of project criteria progressively improved the enrollment of forest lands that faced higher risks of deforestation and hydrological risk by randomly sampling accepted and rejected grant applications and evaluating them based on a set of environmental, social, and economic factors. On the other hand, it was observed that successful applications faced lower-than-average risks; in the first two year of the program 64 percent of enrolled land was observed to face a low risk of deforestation, suggesting that the program could do more to conserve high-value land.[171] This may be due to the fact that selection priorities were shifted away from highly marginalized communities and overexploited areas as the PSAH program moved from a pilot to a national program, trading more focused payments for wider coverage.[172] While the program has certainly enjoyed significant uptake from forest communities, the low level of additionality could motivate efforts to redirect payments to higher-risk areas.

As the PSAH program progressed changes were made to incorporate feedback from program administrators, environmental non-profits, and academics, and more areas of high ecological and social priority were enrolled. From 2004 to 2010, CONAFOR selected applications in areas where hydrologic services were greatly needed. However, the PSAH program may not have enough outreach efforts targeted towards drawing high-risk areas to the applicant pool, but CONAFOR has continued to select high priority areas, such as those in water scarce areas, located above overexploited aquifers, or in protected natural areas, and enrolled more land that was at risk of deforestation and had a higher poverty index between 2004 and 2010.[173]

Studies show that the impact of the PSAH program has changed over time due to the adaptive management style. There was low additionality during the first two years because much of the land targeted by the program was under low or very low risk of deforestation. Hydrologic and deforestation risks represented only 20 percent of the priority criteria, and not many applications from high priority areas were received, so questions remain as to the program's effectiveness in targeting water protection.[174] Another challenge in the program's success is the lack of access to information regarding program requirements and the obligations of the participants after the signing of the contracts.

Monitoring Capacity

A benefit of the large-scale reach of the PSAH program benefits is the academic attention that it receives relative to smaller projects that focus on individual forests. However, the size and decentralized nature of the program makes detailed field monitoring of all enrolled forests almost impossible. The PSAH program relies on random satellite monitoring to ensure that forests are being conserved. Despite the effort to monitor the effects of program, there is difficulty in obtaining high-quality annual data on deforestation. Lack of data availability and associated costs, in addition to difficulties with the interpretation of satellite images, make mapping land cover change a challenge. Cloud cover can further restrict the usefulness of the images, while other forests are difficult to identify remotely. Deforestation events may also be difficult to monitor through this imaging because some forests grow more quickly than others. The socio-economic impact of this project are also monitored and evaluated. The project has evolving priorities, and through assessments conducted by CONAFOR, academics, and consultants, the program has changed to include the degree of marginalization, indigenous populations, and the gender of the applicant.[175]

Conclusion

- In Mexico, water scarcity is a central issue. Connecting forest conservation to water resource management can be an effective strategy for improving the environment and water access, as well as protecting forested land.

- The co-benefits in this program are crucial and are an integral part of the adaptive management that allows for changes in the program to be made while it is being implemented. While watershed protection is an intentional main objective, poverty alleviation was unintentionally addressed in the beginning of the program and then incorporated in the selection criteria. Much of the forestland lies in regions of high poverty, and in some areas the program has provided residents with more income than they would have generated through agriculture and other practices.

- The program's social impact is more apparent than its environmental impact; it helped alleviate poverty, however, it is not clear if the recipients would have conserved the forest even if they hadn't received payments because there is not enough baseline data.

- While the program succeeded in selecting applications in high priority areas for hydrologic services, it was lacking in the number of applicants in high priority areas it attracted. This indicates that there is a need for greater outreach in these areas and collaboration with NGOs to produce education initiatives on the effects of sustainable forest management on water resources.

- The selection criteria of this program have evolved over time, and it is tough to determine the impact of all these simultaneous changes on avoided deforestation and poverty alleviation. It seems that there has been more of an impact on poverty alleviation, but this may be because this can be measured with greater ease than avoided deforestation because money is being dispersed directly to communities and participants. There must be a greater effort to establish baseline data and consistent monitoring of environmental and socioeconomic effects.

- Adaptive management and stakeholder involvement have been important aspects of the PSAH program. The legal framework in Mexico that mandates external evaluations was also instrumental to the success of this conservation program because it provided program managers with robust feedback to incorporate within the goals. With continued adaptive management, the program has the potential to improve and better target its goals and achieve them.

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[Not Attached. Please refer to separate Excel documents.]