

Rewards for, Use of and shared investment in
Pro-poor Environmental Services schemes (RUPES-II)

Where We Work

Brief Profiles of RUPES Action Research Sites

RUPES

REWARDS FOR, USE OF AND SHARED INVESTMENT IN PRO-POOR ENVIRONMENTAL SERVICES

Rewards for, Use of and shared investment in
Pro-poor Environmental Services schemes (RUPES-II)

**A project by the World Agroforestry Centre and
the International Fund for Agricultural Development**

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Foreword

The World Agroforestry Centre - Southeast Asia Regional Programme coordinates the Rewarding Upland Poor for Environmental Services they provide (RUPES) project throughout the world, ensuring a cross-regional approach that maximizes research effectiveness and development outcomes.

Since the Centre's establishment in Southeast Asia in 1992, we have focused on bringing the best of the world's scientists from many disciplines together to focus on projects such as RUPES that have a major impact on food security and livelihoods for some of the world's poorest people.

It is these same people, in some of the most densely populated and geographically volatile areas, who will be at the forefront of events caused by a changing climate, whether those events be increased drought and crop failure or more frequent flooding and landslides. The implications of lack of knowledge and action in these regions, not only for the local communities who rely on forest resources but also for downstream farmers and city dwellers, are manifold. If forests dwindle to a critical point, not only do local communities risk a failure



of food security, but the planet itself faces an increase in average temperatures of more than 2° C.

It is in this context that agroforestry is proven to play an increasingly important role, one which can bring direct benefits to millions of people and indirect benefits to billions more. Our vision is a rural transformation in the developing world that will see smallholder households strategically increase their use of trees in agriculture to improve their food security, nutrition, income, health, shelter, energy resources and protect and nurture the natural environment.

The RUPES project has played an extremely important role in achieving this vision. The team have provided hitherto unknown perspectives, based on solid research, not only to local communities and governments but also to the global community charged with the task of ensuring the wellbeing of our planet. Without the work of the RUPES team, informed global debate would have been less well informed and the need for urgent action less clearly demonstrated; nor would there have been such clearly enunciated and solidly researched evidence for solving some of the dramatic and seemingly intractable problems that currently face all of humanity.

Dr Ujjwal Pradhan
Regional Coordinator
World Agroforestry Centre – Southeast Asia Regional Programme

Overview

The phase I

RUPES–Rewarding Upland Poor for Environmental Services they provide–has become a well-known brand and trusted source of information about the complexity of environmental services rewards schemes.

The project was started in 2002 under the coordination of the World Agroforestry Centre (Southeast Asia Programme) through a funding partnership with the International Fund for Agricultural Development.

During its first phase (2002–2007), RUPES worked in 6 action research sites in 3 countries—Bungo, Singkarak and Sumberjaya in Indonesia; Bakun and Kalahan in the Philippines; Kulekhani in Nepal

RUPES and other similar initiatives have encouraged adoption of improved land and forest management practices. This is especially apparent in Sumberjaya (where its reward mechanism has now gone beyond coffee agroforestry to river care). In Kalahan, a sustainable and ecological approach to land use has been promoted effectively by a tribal community organisation with support from RUPES.

In Bakun and Bungo, RUPES helped local stakeholders reduce pressures to convert land to more commercial uses (vegetables in



Bakun and oil palm plantations in Bungo), averting deterioration of the Bakun watershed and loss of biodiversity in Bungo. In Kulekhani, the district development authority of Makwanpur paid a reward to upland communities as part of hydroelectric royalties obtained from the central government. The upland communities are empowered through development forums to manage the royalties as well as the watershed.

Active in piloting reward schemes on a more localised basis, RUPES has continued to become an effective advocate for the concept of pro-poor rewards for environmental services. During the first phase of the project, RUPES supported the development of national independent networks in Indonesia and the Philippines.

In short, the project's achievements during its first phase included increased awareness at the grassroots level about the environmental services rewards concept; greater land access security for tens of thousands of upland farmers; strengthened local institutions; multi-stakeholder networks and on-site technical working/advisory groups; and increased knowledge of environmental services as global public goods.

As lessons learnt, RUPES has shown that there are at least eight important dimensions in environmental services rewards schemes. Requiring some fine-tuning, these may vary depending on the situation in each locality.

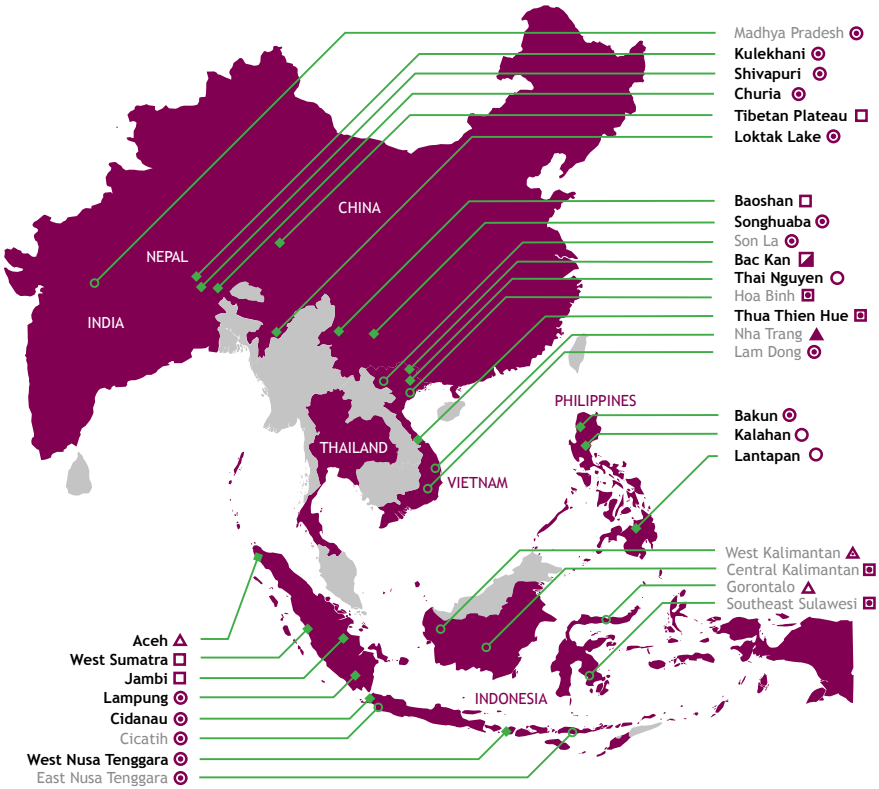
1. The degree to which the environmental services buyers and sellers enter agreements voluntarily.
2. The conditions that apply to payments and service delivery.
3. The duration and contractual form of the relationship.
4. The degree to which the agreements refer to specific cause-effect relationships linked to the continuation of the service.
5. The form of the payment, such as freely usable financial capital, micro-credit, investment in public services or trust funds for specified activities.
6. The level of payment in relation to the cost of lost opportunities for the seller and the costs of alternative provision of the service for the buyer.
7. The degree to which underprivileged (by wealth, gender or social strata) stakeholders are affected and included (pro-poor).
8. The prevailing governance framework that defines the eligible beneficiaries and geographic area.

The phase II

RUPES phase II is designed to follow-up to and expand on the lessons learnt in the phase I. During the second phase (2008-2012), the project has expanded its work to 9 more action research sites in 6 countries: Songhuaba and Tibetan Plateau in China, Loktak Lake in India, Aceh, Cidanau, and Kuningan in Indonesia, Shivapuri in Nepal, Lantapan di Philippines, and and Bac Kan Vietnam. RUPES also continues collaboration with other organizations and projects in 14 learning sites across Asia.

RUPES applies the following strategies to achieve its goals:

1. National policy framework.
2. International and national buyer and investor engagement.
3. Environmental service intermediaries enabled.
4. Innovations in effective, efficient and pro-poor RES mechanisms.



Map of RUPES Action Research and Learning Sites

Legends:

- Carbon, Watershed, Biodiversity
- Carbon, Watershed, Landscape Beauty
- Carbon, Watershed
- Carbon, Biodiversity
- RUPES Action Research Site
- Watershed, Biodiversity
- Carbon
- Watershed
- Landscape Beauty
- RUPES Learning Site

The principles

Amid the increasing popularity of payments for environmental services with focus on market-based mechanisms, the current use of the term actually covers a broad spectrum of interactions between environmental services suppliers and beneficiaries. There are four principles that can shape, in varying degrees, mechanisms of environmental services compensation and rewards: realistic, conditional, voluntary and pro-poor.

The first principle, ***realistic***, applied at the scoping stage of an environmental service project initiation to identify existing problems and potential environmental services, refers to the degree of tangible and sustainable reduction or avoidance of human-induced threats to environmental services flows and associated stocks.

Voluntary, during the multi-stakeholders and power relationship analysis, determines the intensity of engagement of both environmental services providers and beneficiaries in a negotiated scheme through free and informed choice medium.

Discussion on benefits received by environmental services providers that will depend on the performance measurement agreed in contracts between parties is related to the ***conditional*** principle during environmental services rewards negotiation and implementation stages.

The last principle, ***pro-poor***, is a positive bias towards poor stakeholders in terms of access, process, decision making and outcomes of an environmental service scheme, to comply with the Millennium Development Goals and as a step towards long-term sustainability.



CES/COS/CIS paradigms

Based on studies across Asia since 2002, RUPES scientists have developed three environmental services paradigms known as: "Commoditized Environmental Services (CES)", "Compensation for Opportunities Skipped (COS)" and "Co-Investment in (Environmental) Stewardship (CIS)".

The primary difference between CES, COS and CIS is in the way in which "conditionality" is achieved, with additional variation in the scale (individual, household or community) at which the "voluntary" principle takes shape.

CIS approaches have the greatest opportunity to be pro-poor, as both CES and COS presuppose property rights that the rural poor often do not have. CIS requires and reinforces trust-building after initial conflicts over the consequences of resource use on ES have been clarified and a "realistic" joint appraisal is obtained. CIS will often be part of a multi-scale approach to the regeneration and survival of natural capital, alongside respect and appreciation for the guardians and stewards of landscapes.

CES: Commoditized Environmental Services

- **Direct** interaction: ES providers and beneficiaries
- Recurrent monetary payments: **supply** and **demand**
- **No** explicit poverty target
- **Actual** ES delivery and direct marketability:
- Conditionality: **Level 1**



Farmers conducting participatory sedimentation monitoring
Photo by R. Pasha

Example of CES case:
River Care in Sumberjaya, Lampung, Indonesia

Providers:	25 households in Buluh Kapur village collectively established a Buluh Kapur River Care Group
Beneficiary:	PLTA Way Besai, a hydropower parastatal company
Intermediary:	World Agroforestry Centre Southeast Asia Office
Conditionality:	A micro-hydro unit installed (3000 kWh) for 30% decrease of sedimentation level
Time frame:	1 year (2008-2009) and contract is being renewed
Current progress:	The community only decreased the sedimentation level by 19% but the PLTA rewarded with the micro-hydro unit because of goodwill and their appreciation of the villagers' performance. A potential to scale out to neighboring villages is being explored.

COS: Compensating for Opportunities Skipped

- Paying for **accepting restrictions**
- Achievement of a **condition** of (agro)-ecosystem or **effort** (or restrictions in input use).
- Poverty target **added** with certain conditions
- Conditionality Level: **II/III**



A farmer planting trees.
Photo by B. Sanjiol

Example of COS case:
Cidanau Watershed, Banten, Indonesia

Providers:	142 farmers in four villages covering 50 hectares
Beneficiaries:	PT Krakatau Tirta Industri, a private water company
Intermediary:	FKDC, a watershed communication forum
Conditionality:	A minimum of 500 trees per ha and no cutting during the contract period. Yearly payment of US$ 120 per ha for five years
Time frame:	Secured contract for 6 years (2005-2011) with different starting year for each village
Current progress:	The scheme is still on-going with high compliance from the providers. The intermediary is drafting a watershed management policy at provincial level for creating more enabling conditions to scale up the scheme.

CIS: Co-Investment in (Environmental) Stewardship

- Entrust local resource management
- Full trust of management plan and local monitoring with high social capital level
- A flexible contract, broad sanctions and a monitoring requirement
- Conditionality Level: IV

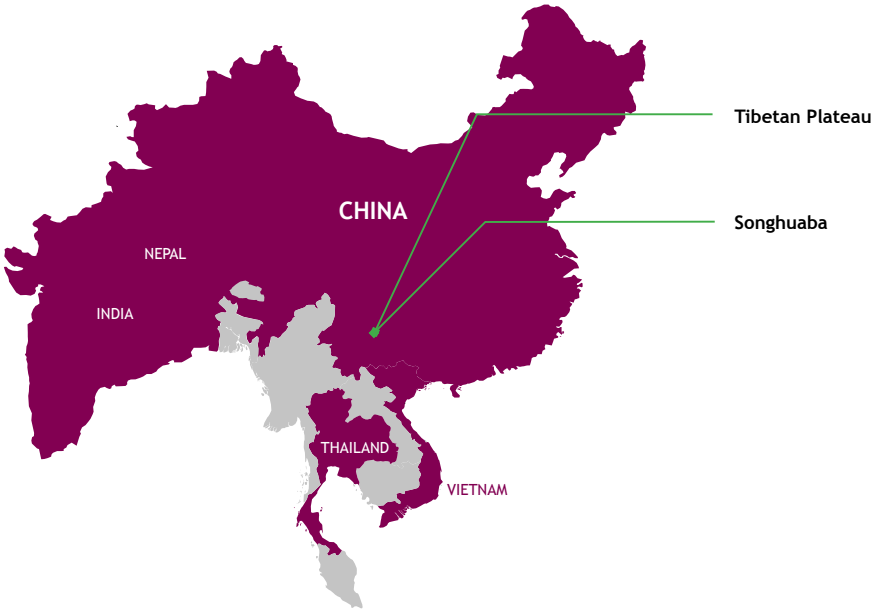


Kulekhani - villagers gathering in a meeting.
Photo by Hariss Tiem

Example of CIS case:
Kuklekhani Watershed, Makawanpur, Nepal

Providers:	8,897 households in eight Village Development Committees
Beneficiaries:	Kulekhani Hydro Electricity Power Company (State)
Intermediary:	Kulekhani Watershed Conservation and Development Forum (KWCDF), Winrock Nepal, ICIMOD
Conditionality:	Management plan to rehabilitate watershed, including sustainable horticulture practices. Royalties transferred from the central government to local government and local community.
Time frame:	Since 2006 up to now
Current progress:	The scheme is still on-going. The team is conducting a review of national policy on royalties from hydropower plants, reviewing the roles, responsibilities and involvement of major stakeholders (sellers and buyers of environmental services).

China



Over the last eight years, China has been implementing some of the largest schemes in the world for environmental services rewards. The Sloping Farmland Conversion Programme provides grain and cash payments to farmers and financial support to grassroots forestry agencies to convert arable land on sloping fields to forest. Following a ban on commercial logging in the upper reaches of the Yangtze River in 1998, the Natural Forest Protection Programme has been financing the transition of state-owned forestry enterprises to forest conservation and supporting forest conservation activities in an area equivalent to around half of China's total natural forest area. Other market-based programmes for watershed services have also been implemented as local and regional pilots.

The early work of RUPES in China focused on building the capacity of researchers and local forest departments to document and understand the impacts of these forest sector programmes, identify issues, develop innovative ways to address them, and support dialogue with policy makers at different levels. This included

convening workshops, providing research-method training workshops, supporting field assessments and experiments and distributing publications. More recent work has expanded from the focus on forest resources to include assessment of the potential for environmental services rewards schemes in watersheds and rangelands.



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Songhuaba

The site

The Songhuaba watershed is located 16 km north of Kunming, the capital city and political, economic and cultural centre of Yunnan province. The watershed provides half the drinking water supply for the 3 million urban inhabitants of Kunming. Covering 630 km^2, the mountainous watershed has 325 villages with a population of almost 84 000. Driven by growing demand from the city, agriculture has intensified over the last few decades and water quality has dramatically deteriorated.

The issues

Local government has relied on land-use planning regulations in an attempt to address the threats to water quality. However, since most of the watershed is under agriculture, broad pollution associated with farming practices is one of the most ubiquitous threats to water quality in the watershed. This cannot be addressed by land-use planning regulations unless restrictions on farming are put in place, which would directly undermine local livelihoods.



The World Agroforestry Centre is exploring the potential of environmental services rewards as a way to meet the demand for good quality water while also improving land management practices. Negotiations between suppliers and users of environmental services are best conducted equitably and based on evidence. Therefore, the Centre is supporting the collection, analysis and communication of evidence on the impacts of land management practices on water quality and quantity in the watershed and supporting studies of farmers' willingness to accept different forms and levels of rewards in preparation for helping with negotiations.

The rewards

The research in the Songhuaba watershed will serve as a platform for both upstream and downstream stakeholders to constructively discuss the issues. Activities to support this will include stakeholder workshops at which the scientific evidence is discussed before starting a pilot rewards scheme to test and demonstrate improved land management practices. The eventual result will be a set of recommendations on preferred reward mechanisms that will be presented to Kunming city and Yunnan provincial governments.

Site partners

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Tibetan Plateau

The site

The Tibetan Plateau is the world's largest and topographically most complex high elevation plateau, with an average elevation over 4000 MASL and average annual temperatures of less than 2°C. The plateau covers the provinces of Tibet Autonomous Region and Qinghai, as well as parts of Gansu, northwestern Sichuan and northwestern Yunnan provinces.

The unique geographical conditions of the plateau make it home to a rich and rare biodiversity of global significance. The plateau's grasslands are essential to the survival of a large number of rare and endangered wildlife. The grasslands are also essential to maintain the region's critical hydrological services. Grasslands with higher vegetation cover regulate the storage and run-off of water, abating soil erosion and flash floods. Grassland soils on the plateau contain about 23% of China's total soil carbon. Grassland-dependent livestock-raising is the primary source of cash and non-cash income for the majority of the plateau's 5 million inhabitants.

The issues

The grasslands play an important role in regulating environmental processes through vegetation cover affecting surface energy reflection, wind drag, evaporation and soil moisture, and provide



significant carbon storage, water regulation and soil conservation and biodiversity services.

Degradation of the grasslands has in recent years been a major concern for national policy makers. China has initiated several mega-projects aiming to conserve the plateau's ecology. A grassland environmental services payments programme is under design and the first pilots began in 2009 in Tibet AR.

While there is a growing body of evidence on the impact of grazing on various environmental services, other aspects related to development of environmental services schemes are much less well understood. There is some existing experience with payments schemes in China's grasslands, but lessons have not been systematically collated and analyzed. Economic analysis of grazing systems in the region is also very sparse, which presents difficulties for estimating the impacts of different reward options on household welfare. A lack of sufficient evidence when designing an environmental services payments scheme may hinder any such scheme's effectiveness in improving land management and delivering better environmental services.

The rewards

The first pilots of a grassland environmental payments scheme started in 2009. Full details of the scheme have yet to be worked out. Some past grassland programs that were similar to environmental payments schemes focused on paying compensation for prohibiting grazing in degraded areas. But these schemes did not systematically address how to improve livestock production and may have displaced grazing to areas outside the prohibited areas. The Centre is supporting a policy research institute of the Ministry of Agriculture to document the pilot scheme and to draw on lessons from other schemes so as to make recommendations for creating a voluntary, conditional and effective environmental services payments scheme for China's grassland areas.

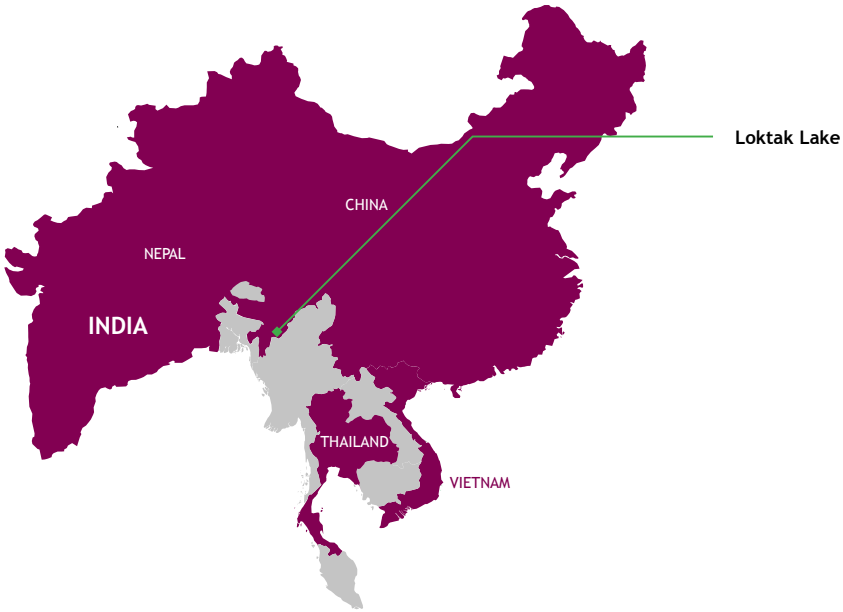
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India



India is bestowed with a rich biodiversity. The services provided by this biodiversity form the basis of the ecological and economic security of the country. However, sustaining biodiversity is challenged by the developmental needs of a large population and high levels of poverty.

The national environmental policy strongly emphasises the role of economic instruments in various forms to achieve sustainable development. Achieving economic efficiency in natural resource use is one of the core principles of the policy. The role of economic instruments, which aim to rationalise incentive structures and promote sustainable use of natural resources, is also emphasised. Despite this, environmental services payments schemes are still in their early stages. There are some watershed-scale applications, which highlight various challenges in environmental services' descriptions, measuring additionality, maintaining conditionality and accounting for

transaction costs. A capacity-assessment survey for implementation of environmental services payments schemes to repair land degradation showed that while an understanding of environmental services does exist, there is insufficient capacity to value incremental change, which limits the application of any such schemes.



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Loktak Lake

The site

Loktak and associated lakes are multifunctional systems providing ecological and economic security to the entire northeastern region of India. These floodplain wetlands provide fish and vegetables, moderate floods, support rich biodiversity and are inextricably linked to the Manipuri culture. They cover 469 km^2, with Loktak being the largest wetlands of the basin, accounting for over 60% of the system's area. Because of its high ecological and socio-economic importance, Loktak was designated by the Government of India in 1990 as a Wetland of International Importance under the Ramsar Convention.

The issues

The diverse range of environmental services derived from Loktak Lake is under stress owing to lopsided developmental planning within the basin. Water resources development projects for flood mitigation, agriculture and hydropower have led to modification of hydrological regimes, seriously impacting the processes, functions and attributes of the wetlands. In particular, in 1984, the construction of the Ithai barrage downstream of Loktak entailed regulation of lake levels for hydropower generation.

Rapid population growth in the hills has led to expansion of the area under shifting cultivation, which has increased lake siltation and flooding. High levels of urbanisation with inadequate sewerage systems has led to dumping untreated sewage into the lake, leading to a decline in water quality. This declining resource base, with increasing population pressure, has forced an increase in harmful fishing practices. However, at the core of the lake's degradation is lack of integration of environmental services into development planning.

The rewards

Conservation and management of Loktak Lake requires a strategic shift in water management. Human needs need to be balanced with the multiple values of the lake. Adopting a stakeholder-driven process is probably the best way to do this. Wetlands International (South Asia) and Loktak Development Authority, the government agency for lake management, are developing a water allocation strategy harmonizing water allocation for ecological and human needs.

With current restoration measures under way, the development authority is in a unique position to be a provider of lake environmental services for hydropower. The hydropower company and the lake management authority are the respective potential buyers and sellers of sustainably provided water for hydropower.

The project will design a suitable environmental services payment scheme and build institutional capacity and arrangements for its successful implementation. Activities carried out so far include an economic valuation of the various environmental services of Loktak Lake and a cost-benefit analysis to assess the economic impact of inefficient water management.

Site partners

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Indonesia



The environmental services debate in Indonesia gained more attention after the RUPES project organized a national seminar in February 2004. Conducted at the office of the Indonesian National Development Planning Agency (BAPPENAS), the seminar was attended by environmental services practitioners from many parts of the country. At the end of the seminar, the participants agreed to form a national-level network (named COMMITTEES) to encourage design and application of environmental rewards schemes to protect the environment and improve the welfare of poor farmers in upstream areas. The COMMITTEES members are currently working hand in hand with a number of parties to pass a regulation on environmental services in Indonesia.

At the field level, a number of non-government organisations have tried to carry out some pilot environmental services rewards projects. Lembaga Penelitian, Pendidikan dan Penerangan Ekonomi dan Sosial/Institute for Research, Education and Economic and Social Affairs worked in Cidanau (Banten province) and Brantas (East Java province) in collaboration with the World Wide Fund for Nature and Rekonvasi Bhumi, a local NGO in Banten. In West Lombok (West Nusa Tenggara province), the World Wide Fund for Nature helped local water users and upstream farmers at Mount Rinjani reach an agreement on water distribution to help protect the Rinjani watershed.

In 2003, RUPES started to conduct action research projects in a number of sites in Indonesia.

1. Bungo (Jambi province, Sumatra), examining the possibility of eco-certification of rubber from agroforestry systems managed by smallholder farmers.

2. Singkarak (West Sumatra province), establishing better management of Singkarak Lake and watershed.
3. Sumberjaya (Lampung province), applying community forestry schemes and a river care program.

Today, environmental services in Indonesia play an increasingly significant role in the national discourse, as witnessed by the increasing number of collaborative programs—both pilots and full implementation—involving various stakeholders, including the government (especially the Ministry of Forestry), local NGOs, and national and international research and development agencies.



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Aceh

The site

After the 2004 tsunami, the socio-economic situation in Aceh, in general, has gradually recovered. The welfare of Acehnese communities has improved and the poverty rate has declined from 26.7% in 2007 to 23.5% in 2008. In addition, communities' income per capita has increased from IDR 4.89 million (+USD 545) per year in 2003 to IDR 5.7 million (+USD 635) per year in 2007 (excluding the oil and gas sectors).

The agriculture sector contributes the largest part of the gross regional domestic product in Aceh: 29.60%. The agriculture sector remains the highest employer, at 50.88%. However, deforestation and marginal land in Aceh has also increased, driven by factors such as poor forestry and agricultural practices and increasing conversion to grazing land.



The issues

In 2007, the Government of Aceh launched Aceh Green Vision, which was intended to attract investment and at the same time assure sustainable management of natural resources. With forest that covers 60.22% of the total area of Aceh (5 539 000 ha), the province has huge potential to deliver a bundle of environmental services. Reliable and transparent payments for environmental services are needed to capture international, national and local demand. Environmental services payments policies and schemes is compatible with Aceh Green Vision and will contribute to economic development. If effectively implemented, such schemes will provide incentives for sustainable land management and are critical to achieving Aceh Green Vision's goal in a socially equitable, and environmentally sustainable, way.

The rewards

The United Nations Economic and Social Commission for Asia Pacific, together with the World Wide Fund for Nature, Lembaga Penelitian, Pendidikan dan Penerangan Ekonomi dan Sosial/Institute for Research, Education and Economic and Social Affairs, and the World Agroforestry Centre, have designed a model for paying for environmental services in two watersheds in Aceh: Krueng Aceh and Krueng Peusangan. These two watersheds are in a critical condition yet still play a significant role for many parts of Aceh, in particular, Banda Aceh and Lhoksemawe. Kreung Aceh is home to the Keuliling Reservoir and rubber plantation, which are important resources for two water companies: PDAM Tirta Daroy (Banda Aceh city) and PDAM Tirta Montala (Aceh Besar district).

A number of preliminary studies have been carried out in Aceh, including the identification of types of environmental services, service providers and beneficiaries.

Site partners

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World Wide Fund for Nature
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Bungo

The site

Bungo district in the Batang Hari watershed is located in the western part of Jambi province on the island of Sumatra. Jambi is the third largest rubber-producing province in Indonesia. The district is between 1°08′ and 1°15′ latitude and 101°27′ and 102°30′ longitude. The region is relatively flat, with an altitude of less than 500 MASL. Approximately 50% of the land is covered by rubber-based systems, of which 15% are old rubber agroforests or 'jungle rubber', now becoming increasingly important as a reservoir of forest diversity and other forest services that are similarly valued in natural forests.

The issues

In Jambi, rubber is the major source of income and the world market price dictates economic returns. Low rubber prices over the past few years have brought a substantial part of the province below the poverty line. A decade ago, Jambi was better off and attracted economic migrants from other parts of Indonesia.

In recent years, the enormous increase of oil palm plantations has reduced the amount of jungle rubber in Jambi. Oil palm plantations provide more income per unit of land with less labour.



The plantations threaten not only the environmental services provided by jungle rubber but also livelihood opportunities. Without rewards for the environmental services provided by jungle rubber, this environmentally sustainable agroforestry system will soon be replaced by oil palm plantations.

The rewards

Rewarding rubber agroforest tappers

Current efforts to better understand rubber marketing mechanisms have identified a number of obstacles (product quality and processing of jungle rubber links to the least eco-sensitive segment of the rubber market), but more work appears to be warranted. In the short term, RUPES expects buyers will respond positively to a proposal that will provide direct support to village communities who agree to protect a substantial area of old rubber agroforest.

Eco-certified natural rubber from sustainable rubber agroforestry

The Centre is continuing research on the profitability and environmental quality (carbon stock and biodiversity) of traditional and intensive rubber production systems in Indonesia. We are exploring opportunities for recognizing the environmental quality of rubber production systems in special product lines.

Ensuring a sustainable mechanism

RUPES has contributed to some changes in Bungo's communities, ranging from the establishment of farmers' groups to increasing the awareness of local officials on the environmental consequences of monoculture plantations. In order to maintain the current positive processes and to respond to future situations, communities need to be able to adapt to change wisely. Local and national institutions are expected to provide support in building farmers' capacities as well as playing a role as intermediaries between the communities and the international buyers.

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Cidanau

The site

Cidanau is an important watershed, supplying domestic and industrial water needs and protecting biodiversity. It covers 22 260 ha in both Serang and Padeglang districts in Banten province. Part of the watershed includes Rawa Danau Reserve, a 4 200 ha nature reserve that contains the last lowland swamp forest in Java and is home to 131 endemic species. The reserve also plays an important role as water catchment for the Cidanau River.

The issues

Numerous efforts have been made to overcome watershed problems in Cidanau, including a forced transmigration program for the communities living in the Rawa Danau Reserve, reforestation and land rehabilitation. However, lack of consultation and planning, as well as lack of attention to social outcomes, has led to failure in solving the problems.

This failure triggered the establishment of Forum Komunikasi Daerah Aliran Sungai Cidanau/Cidanau Watershed Communication Forum (FKDC) in 1998, which aimed to increase public and local government awareness of the environmental problems in the watershed and lead conservation efforts. In 2002, the forum received recognition from Banten provincial government and gained legal status through a governor's decree.



The rewards

The watershed services payment scheme process started by identifying stakeholders.

The sellers: Four farming communities in the upstream areas of Cidanau watershed were identified as the service providers. They were identified based on the critical state of their land, including steep slopes and erosion-prone areas.

The buyer: The state-owned water company, Krakatau Tirta Industri (KTI), provides water to the Cilegon industrial area, another state water company and a power company.

FKDC was the intermediary, not only assisting farmers but also administering and monitoring the rehabilitation processes.

The price was decided upon during negotiations between the buyer (KTI), the intermediary (FKDC) and the sellers (the four farming communities). The price was then formalized in a Memorandum of Agreement between KTI and FKDC.

Site partners

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Kuningan

The site

In 1998, the Government of Indonesia changed the designation of Mount Ciremai Protection Forest in Kuningan and Majalengka districts of West Java (approximately 15 500 ha) to national park. Under a national park management system the area could be better protected and Mount Ciremai's natural resources and ecosystem could be optimally utilized. The park functions as the water catchment for surrounding districts, including Cirebon, Indramayu, Majalengka and Kuningan. It is an important water catchment for these communities, providing water for drinking, domestic, agricultural, fisheries and industrial purposes.

The issues

The forest in the park has been disturbed owing to agricultural encroachment and fires, which has created more marginal land. This has had a direct impact on the water supply to surrounding areas, including decreasing water discharge from rivers and springs, in particular during the dry season.

Previously, the forest area's status was as protection forest and production forest (managed by PT Perhutani, the state-owned forestry



company). At that time, the local government of Kuningan district cooperated with the governments and corporations of Cirebon city and district. This cooperation was through a form of environmental services payments scheme, in which the Cirebon district government and corporations paid Kuningan district for water. This generated additional income for Kuningan district. However, the transaction process was not transparent and the implementation of conservation measures in the park as well as development of the communities around it was not clear. The water payments were bundled with other income sources by the government, making it almost impossible to ascertain the amounts provided to the environmental services' sellers, the communities surrounding the park, as payments for their services.

The rewards

The project aimed to introduce the concept of environmental services rewards for Mount Ciremai National Park and to empower collaboration among stakeholders at the district and provincial levels. In the future, it is expected to have one collaborative institution that will be able to accommodate the interests of all stakeholders and become the intermediary for environmental services rewards schemes.

Several activities have been initiated, including focus group discussions, workshops and dissemination of information to stakeholders at the district and provincial levels. The current environmental services agreement (water service), involving a number of upstream and downstream villages in Kuningan district, will also be strengthened.

Site partner

KANOPI Kuningan

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Singkarak

The site

Lake Singkarak, approximately 21 km long and 7 km wide, is located between the cities of Padang Panjang and Solok in West Sumatra. In 2002, national strategy studies on the clean development mechanism, conducted by the Indonesian Ministry of Environment, identified the Singkarak watershed as a potential site for implementing a national reforestation/carbon project. The system of governance in West Sumatra has changed from village to *nagari* as part of the decentralization process. The traditional *nagari* system effectively manages local natural resources. More than 400 000 people inhabit 13 *nagari* surrounding the lake.

The issues

Logging activity in the past time has created thousands of hectares of bare lands which have not recovered. Agriculture in the uplands has encouraged the growth of *alang-alang* (*Imperata cylindrica*). Previously, many scientists considered erosion in Singkarak to be the main problem and grassland reforestation as the best way to improve environmental services, particularly to increase water supply. However, RUPES has revealed that reforestation might not be the only answer. The change of inflow in Lake Singkarak has also been caused by the changing rainfall pattern and a hydropower plant.

The rewards

Flowing money to upland communities

Together with the hydropower producer and local communities, RUPES established a scheme to distribute royalties. This is not only benefiting communities through improvement of their economic condition, but also helps electricity production.

Rehabilitation of coffee garden

Nagari Paninggahan are currently revitalizing an old, 100 ha coffee garden, part of their 1000+ ha customarily managed forest. They use organic coffee production methods, benefiting from 50 years of no fertilizer use, and provide a clean water flow into Lake Singkarak. RUPES will establish a pilot plot that maintains environmental protection and optimizes community income.

Rehabilitation of grassland into agroforestry through a voluntary carbon system

RUPES and CO_2Operate BV from the Netherlands have begun work on a voluntary carbon market in Nagari Paninggahan. So far, 50 ha of land has been registered to the program and planted with various tree species to develop an agroforestry system.

Environmental Education Centre

An Environmental Education Centre has been proposed to integrate all RUPES programs in Singkarak and to lead comprehensive and sustainable action to protect Lake Singkarak. The centre is intended to be a focus of environmental knowledge that will integrate with communities' daily lives.

Site partners

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Sumberjaya

The site

Sumberjaya is a sub-district in the Bukit Barisan mountain range. These mountains span the west coast of Sumatra and form the upper watersheds of all major rivers on the island. The 55 000 ha sub-district almost coincides with the Way Besai upper watershed at between 720 and 1900 m.

The population was approximately 87 350 in 2004. At least 40 percent of the sub-district is classified as protection forest and 10 percent as national park. Nevertheless, coffee gardens now cover around 70 percent of the total area. The Way Besai watershed supplies a hydroelectric run-off dam of PLTA Way Besai. Electricity generation started in 2001 with a maximum capacity of 90 MW.

The issues

The government believed that uncontrolled deforestation and conversion to coffee on sloping land in Sumberjaya had led to a serious increase of erosion. The erosion threatened the operation of the newly constructed Way Besai hydropower dam and reduced water availability for irrigated paddy rice downstream. This belief resulted in the eviction of thousands of farmers from Sumberjaya forests between 1991 and 1996. However, studies by the World Agroforestry Centre since 1998 show that multi-strata coffee farms control erosion in a way similar to that of natural forest as well as providing livelihoods. Coffee farming and forest protection should not be considered as two opposed practices.

The rewards

Community Forestry Program (HKm)

Since 2004, RUPES has provided support to local communities to gain access to the Government of Indonesia's Community Forestry Program (HKm). The HKm program gives farmers conditional land tenure to cultivate protection forest. In exchange, farmers adopt environmentally friendly farming practices and protect the remaining natural forest, thus ensuring that the land will continue producing watershed protection benefits. The HKm program currently covers 70 percent of Sumberjaya's protection forest, involves nearly 6 400 farmers and 13 000 ha. RUPES interprets the HKm program as a form

of rewards for farmers who provide environmental services. HKm represents a major success for farmers, who are no longer at risk of eviction.

River Care Program

Way Besai hydroelectric company (PLTA) in Sumberjaya would need to pay up to USD 1 million a year to clean sediment from their reservoir. This cost may not be necessary if they can keep sediment from reaching their reservoir in the first place. RUPES set up a pilot project with the community in one sub-catchment area and PLTA to develop a mechanism of payments for reducing sediment through the River Care program. Farmers constructed dams and drainage along pathways and terraces. RUPES helped with the technical sediment monitoring and calculation. Conditionality is the main principle. During the commitment period, the River Care group received USD 1000 for a reduction of 30 percent or more, USD 700 for a 20 to 30 percent reduction, USD 500 for a 10 to 20 percent reduction and USD 250 for a less than 10 percent reduction.

Site Partners:

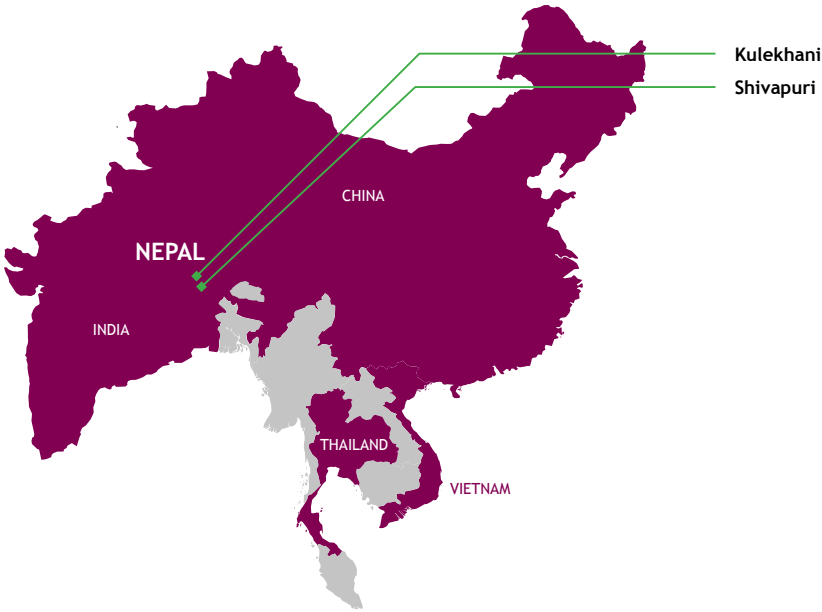
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Nepal



Mountain ecosystems are endowed with rich biodiversity and immense and unique beauty; they are also important watersheds and sinks of carbon. The services provided by these ecosystems are basic to life: food, energy and other essential services for the well-being of human and nature both upstream and downstream. The people living in these mountains protect watersheds, biodiversity and forests. However, there are limited economic and institutional incentives to the local communities who manage these ecosystems. There are numerous examples from Nepal and India that reflect the potential of environmental services payments schemes for improving management of natural resources. However, policies that are required to bring such schemes into the mainstream of resource management and development are almost non-existent in all the Hindu Kush-Himalayan countries (Afghanistan, Pakistan, India, Nepal, Bhutan, China, Bangladesh, Myanmar) where the International Centre for

Integrated Mountain Development (ICIMOD) is actively generating and sharing knowledge about natural resource management.

In collaboration with Winrock International, RUPES implemented a project in Kulekhani watershed in order to develop and test an appropriate environmental services payments mechanism that will provide incentives to the communities living in the catchment area to reduce siltation in the reservoir of Kulekhan hydropower plant and increase dry season flow in the rivers and streams. Various awareness-raising and community-mobilization activities led to successful negotiations with the government for using some of the royalty money as incentives to the upland communities. An environmental management special fund was established under the Makwanpur district development committee that allocates the royalties for the hydropower plant-affected villages, including the upstream communities. National policies related to hydropower revenue are being reviewed while the perspectives of local people about the tested environmental services payments mechanism are being studied. The outcome of earlier RUPES work will be used to discuss necessary policy changes in the country.

In Shivapuri National Park inside Kathmandu valley, a review of the existing information, stakeholders' views and national policies is underway. Based on the review, a framework for a potential environmental services payment mechanism will be developed in which the indigenous communities living in and around the park will receive incentives for their role in conservation. The park's catchment provides drinking water to Kathmandu valley. The study is led by ICIMOD in collaboration with the World Agroforestry Centre. Another study initiated by ICIMOD is assessing the service provided by community forest users in providing drinking water to tankers that are becoming an important supplier to the population in Kathmandu.

RUPES Nepal

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Kulekhani

The site

Kulekhani watershed is located 50 km south-west of Kathmandu. It is the source of water for the Kulekhani reservoir that supplies water to hydropower plants downstream. The 92 MW Kulekhani plant is the only storage-based plant in the country; it provides about 17% of the total hydroelectricity generated in Nepal. There are about 8 000 households with over 45 000 residents in eight villages in the catchment area. Most households depend on agriculture and livestock. Intensive agriculture for commercial vegetable production and paddy rice is increasing. Community forests in the watershed are well protected and forest cover has increased over the last two decades.

The issue

The reservoir depends on water from the watershed of 12 500 ha. The four months of monsoon account for around 80% of annual precipitation. Within this watershed, there are settlements and a mosaic of different land uses. Land use in the upstream area directly affects the water storage capacity of the reservoir. Sedimentation, caused by intensive agriculture and land disturbance, is the main problem for hydropower plants in Nepal. The Kulekhani plant faces not only high sedimentation in the rivers but also low dry season flow. Economic losses associated with siltation in the reservoir are very high. While



many check-dams were built along the rivers to reduce siltation in the reservoir, there was no program to encourage upland communities to practise more conservation-orientated farming and there were no incentives provided by the hydropower company to the community forest users for protecting and sustainably managing the forests.

The legislation in the country mandates all hydropower plants to pay royalties to the central government and 12% of this royalty is channelled back to the district that houses the power plant. However, there was no acknowledgement of the role of upland communities and forests in providing hydrological services.

The rewards

In 2003, RUPES started to work with upland communities in Kulekhani and the hydropower company to foster a win-win situation based on an environmental services payments mechanism. Programs were implemented with local communities and other stakeholders to increase awareness about environmental services and to promote conservation farming in the uplands. A local Kulekhani watershed conservation and development forum was established to increase communication between different stakeholders and to promote conservation. The forum actively pursued and succeeded in developing an environmental services payment mechanism based on the 1999 Local Self-Governance Act and the 1992 Decentralization Act. At district level, for the first time in Nepal, a Hydropower Royalty Distribution and Use Directive (2062) was issued by Makwanpur district development committee to allocate 50% of the royalty it receives from the central government to the 12 hydropower-affected villages (eight in the upland, two in the surrounding area and two downstream). An environmental management special fund was established under the Makwanpur committee that oversees the distribution and allocation of the royalty budget. Continuing work includes review of national policy on royalty from hydropower plants and a review of the roles, responsibilities and involvement of major stakeholders (sellers and buyers of environmental services). A national policy workshop is being planned.

The partners

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Shivapuri

The issue

The managers of Shivapuri National Park face major difficulties. Deforestation for agricultural cultivation and harvesting of forest products, coupled with human-wildlife conflict, are serious issues. About 100 000 local people's livelihoods depend on access to forest resources and continued cultivation of park areas. A limited budget for park management makes it difficult to effectively control deforestation. This is compounded by local people having no interest in upland conservation because they do not receive tangible benefits. Upland watershed conservation is of significant economic value to the downstream population, but received at low or zero cost by water users, and with low or zero reward to the upland conservation efforts of the locals and the park authority.

The park's story is also a story of quintessential conservation at the cost of local livelihoods. There were, and still are, people living inside the park and they have literally been fenced in. The enclosing of the park led to the land use and ecosystem of the catchment improving significantly, while the local people's status worsened, with many households living in poverty, especially because of wildlife-people conflict. The International Union for Conservation of Nature's biophysical-economic-livelihood assessment of conservation inside the park indicated that even though conservation makes economic sense, continuing to expect catchment land and resource managers to cover the costs of conservation for downstream water benefits will further marginalise the indigenous people.



Potential for environmental services payments

While all evidence points to the need and potential of a reward mechanism for improving conservation and local livelihoods, there is little clarity on how it can be designed and what are the issues for policy. There are multiple stakeholders: Department of National Parks and Wildlife Conservation, local communities living in and around the park, Nepal Army guarding the park, Kathmandu Upatyaka Khanepani Ltd (representing the water users in Kathmandu) and local communities living downstream. It is a complex web of conflicting interests and goals and developing a mechanism will take time and much effort.

Current and future work

Preliminary investigation about hydrological services of the watershed and the potential influence of land-use changes has been conducted by ICIMOD. Some work on the valuing the provision of drinking water was done by IUCN Nepal. Continuing from available information, more work is underway.

1. Review existing information about the park management related to watershed services, valuation of environmental services related to drinking water supply, the service providers, service beneficiaries and relevant policy and legal issues related to maintenance of water and biodiversity services by the local people.
2. Identify policy gaps and make recommendations for law and policy adjustments to enable a reward mechanism that can improve both conservation inside the park and the livelihoods of the local communities living in and around it. Downstream users will benefit from improved water supply through better watershed protection upstream.
3. Develop an environmental services payment framework that can be implemented as a pilot scheme.

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Philippines



The Philippines has severely degraded natural resources. The situation has adversely affected the environmental services they provide. In the early 1900s, it was estimated that 70 percent of the country was covered with 21 million ha of forests (Garrity et al 1993). However, only 6 million ha of forests remained in 2004 (FMB 2004). Thus, in eleven years, the Philippines lost 15 million ha of tropical forests.

Since the early 1970s, when extensive reforestation efforts began in the Philippines, various incentive schemes had been implemented





to encourage people to plant trees on private and public land. However, after more than three decades of support, reforestation efforts in the Philippines have largely been ineffective and inefficient (Chokkalingam et al 2006, Garrity et al 1993) partly because the incentives provided were either inappropriate or did not consider the long-term nature of reforestation.

Partly in response to the limited success of government-initiated programs, a number of local governments, research organisations and NGOs in the Philippines were testing various environmental services payments schemes as a way of reversing environmental degradation.

The RUPES Philippines project was designed to test the environmental services provided through water resources and carbon sequestration. In 2003, Kalahan was selected as an action research site to develop a carbon sequestration payment mechanism and, in 2004, Bakun was selected to test the mechanism for watershed payments. In 2006, Lantapan became a RUPES associate site, then an action research site in 2008 for testing a watershed services payments mechanism. Through these sites we hope to establish a rewards mechanism that will encourage people to protect and conserve the environment.

RUPES Philippines

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