

In Sumberjaya, the hydropower company and government officials learn that with proper incentives, upland people can deliver clean water for increased electrical output

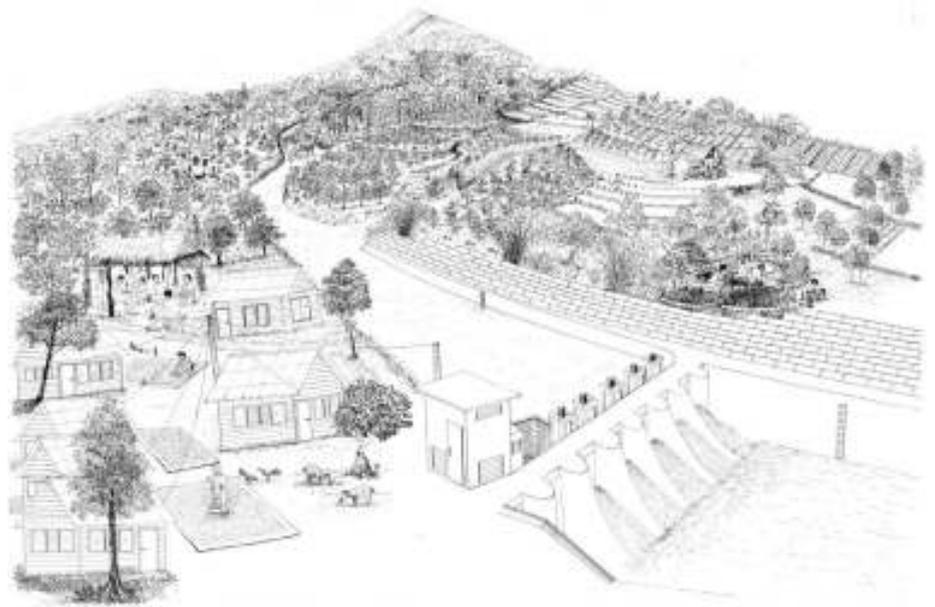
The Context: Realism on Environmental Services Ends Decades of Land Conflict

Blessed with ample rainfall, Indonesia has exploited hydropower to meet its electricity needs, but the supply is sensitive to interruptions in water flow linked to climate variability. Land use practices that don't fill with sediment the natural or manmade reservoirs that supply water to hydropower plants are needed as environmental services.

According to conventional wisdom only forests can provide such environmental services. Landscapes used for upland farming can not. Given the size of the Indonesian population, however, ways have to be found to combine hydropower generation with productive land use. A key example of how this can be achieved if the real requirements for watershed functions are understood can be found in Sumberjaya in West Lampung, Indonesia.

A decade ago there were many conflicts in the area. Forced eviction of farmers who had been using the area for growing coffee caused the relationship between local people and the various layers of government to deteriorate rapidly.

In contrast, the area now justifies its name which means 'source of wealth' in Bahasa Indonesia. It provides livelihoods to approximately 90,000 people while supporting the main source of electricity for the province. Sumberjaya has had to make some real tradeoffs between land use practices and environmental services, but the site's overall message is primarily of compatibility of livelihood use with environmental services and of opportunity to resolve conflicts.



Schematized view on the mosaic of coffee farms, rice fields, forest and hydropower generation in Sumberjaya.

The concept of rewards for environmental services is built on two separate principles:

- stabilization of the forest margin into which farmers are actively migrating by offering forms of land tenure that are conditional on the farmers maintaining environmental services ('tenure as reward'), thus replacing conflicts and uncertainty by cooperation and acceptance of the farmers.
- voluntary rewards for activities on village and farm lands that enhance the critical environmental services of main interest. Measures to increase infiltration of water can be taken at plot scale by individual farmers; measures to reduce the sediment load of streams require collective action of all users of a sub-sub-watershed.

What Needed to Be Done? Build Trust by Providing Ways to Verify

Sumberjaya's history of conflicts and lose-lose solutions provided space for a win-win recovery but only after basic levels of trust were established and by making use of a new legal opportunity created by Indonesian law: community-based forest management (HKM) within the protection forest zone. Before RUPES-Sumberjaya started activities, the first agreements for conditional land tenure had been signed and appeared to work satisfactorily. RUPES helped to scale up these results so that now 70 percent of the forest margin is covered by agreements with additional agreements for the remaining forest in progress. Farmers using the substantial areas of village and private land needed to be included, as initial analysis showed that their farms and land-uses close to the river had more effect on watershed functions than uses in the forest higher up the slope.

RUPES analysis of this situation pointed to 5 important strategies:

- facilitating the further expansion of conditional tenure agreements under community-based forest management, at reduced transaction costs by involving local forestry officials;
- developing accurate, scientifically-validated information on sources of erosion and sediment and on the dynamics of river flow to replace the myths of 'conventional wisdom';
- working with the farmers to develop skills and understanding in management practices, including enhancement of infiltration and monitoring, that reduced erosion and sedimentation;
- empowering farmer communities to use the factual information generated to give them more credibility and status when negotiating for their needs; and
- designing and testing mechanisms for conditional payments for environmental services. With payments based on actual reduction in sediment, government and hydropower company officials could have more trust that their payments actually bought something of value.



Award ceremony for conditional tenure agreements for the forest margin



Farmer group discussion on management options for mixed coffee gardens

What Succeeded?

Conditional Land Tenure: Pathway to Healthy Landscapes and Enhanced Livelihoods

"Today is one of the most important days of my life. ... Finally I got permission to stay on the land I have been farming," said upland farmer Mr. Darmadi with tears in his eyes. Surely the tears came from a memory of forced evictions 10 years earlier and relief from the daily anxiety of knowing that at any moment the government could take away everything he needed to earn his livelihood. Since RUPES Sumberjaya began work in 2004, the government has awarded conditional land tenure to nearly 6,400 farmers. With these awards, the government acknowledges that properly managed agroforests can bring the same watershed benefits as natural forests. In exchange for their land tenure, the farmers promise to conserve still existing patches of natural forest and to use good management practices. Now, conditional land tenure permits account for 70 percent of Sumberjaya's protection forests, compared to 7 percent in 2004. An impact study conducted with researchers from Michigan State University and the International Food Policy Research Institute found that conditional land tenure in Sumberjaya doubled local land value, reduced corruption, increased incomes by about 30 percent mostly due to reduction of bribes, and gave farmers incentive to protect remaining natural forest. see further in RUPES Sumberjaya Brief No. 1.

Site profile: RUPES Sumberjaya

More Coffee-Agroforest Trees, More Trust

Credibly designed and conducted research found that multi-story coffee gardens provide as much sediment control as forest. And, the coffee gardens also provide livelihoods for forest residents. Empowered with this research, upland community members got the attention of government officials, leading to meaningful negotiations. Methods that increase water infiltration into coffee gardens initially require a rather high initial labour investment. However, a RUPES experiment using an auction-like bidding system established that farmers would voluntarily implement such methods on their own lands if about half of their labour costs are subsidized.

RiverCare group responds to the challenge and to conditional reward schemes

Community members learned to monitor and control the local sources of sediment in their streams and take action. A financial reward scheme provides some funds upfront and then pays additional specified amounts based effects achieved see further in RUPES Sumberjaya Brief No. 2.

Hydropower Company Prepared to Come to the Table

Advised by RUPES Sumberjaya, RiverCare has kept the hydropower company informed of its progress in delivering and measuring watershed services. The company has expressed active interest in negotiating for services if the pilot effort proves successful.

What's Next?

More research to link actions to results

One of the primary achievements with the RiverCare initiative was developing an easy-to-use way to link environmental service performance directly to the size of payments. Such conditional mechanisms allow buyers to see the actual value of the services to their bottom line. Linking payments to performance is only one step,



Mixed coffee agroforestry garden



RiverCare: interventions to stabilize river channel and reduce sediment loads

however. Perhaps more valuable is research that links specific actions to degrees of improvements. With research that shows these links, environmental service providers can design truly effective plans for improving their performance. In doing so, they can provide greater value to external customers and earn more income in the process.

Research on linkages can also make conditional land tenure more effective at producing good conservation outcomes and therefore make it a more attractive option to governments and policy makers. For now, the tenure is conditional on farmers doing agreed upon activities. Hopefully, additional research can show the linkages of activities to performance. With these kinds of linkages, farmer communities can take on responsibility



Sustainable way into the future

for managing environmental results, rather than just taking mechanical actions. RUPES researchers and the farmers are very eager to measure improvements in water quality now that conditional land tenure arrangements account for 70 percent of the production forest.

Scaling up to improve livelihoods of millions of squatter families by increasing environmental services

Sites like Sumberjaya exist throughout Asia where exclusion of local people from forest livelihoods condemns them to poverty. The living laboratory of Sumberjaya can be used as inspiration and learning ground.

The RUPES Project:

Throughout the world, upland people, many of them poor, earn their livelihoods from lands and landscapes that, when properly managed, provide valuable environmental services to others. However, management practices that maintain or increase environmental services often have a cost to the upland people in time or income. Regulations and prescriptions of land use aimed at securing the services are often ill-designed and enhance rural poverty. RUPES aims to work with both potential users and producers of environmental services to find conditions for positive incentives that are voluntary (within the existing regulatory framework), realistic (aligned with real opportunity costs and real benefits) and conditional (linked to actual effects on environmental services), while reducing important dimensions of poverty in upland areas.

At each of the 6 RUPES action sites, local institutions partner with the World Agroforestry Centre (ICRAF) to implement action research aimed at developing effective reward mechanisms in the local context. The sites are Kulekhani in Nepal; Sumberjaya, Muara Bungo, and Singkarak in Indonesia; and Kalahan and Bakun in the Philippines. National policy dialogues are aimed at making policy frameworks more conducive to positive incentives.



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