

Lessons on the Conditional Tenure and RiverCare Schemes in Sumberjaya, Indonesia:

Conditionality in Payment for Environmental Services

By S. Suyantoⁱ

Summary

In the tropics, most PES mechanisms for watershed functions are based on the assumption that such functions are being provided, without clear proof that this is actually the case. However, conditionality is a fundamental component of PES. In order to achieve conditionality, it should be clear what the service being provided is and how it will be evaluated. RUPES has implemented two action research projects in Sumberjaya, Indonesia to address the conditionality issue. In the first project, land tenure for forest land stewardship is conditional on the land management activities of the sellers. The second project involves a more advanced set of indicators, with payments conditional on the results of sediment reduction activities.

Background

Sumberjaya, which means “source of wealth,” has ironically become emblematic of forest land conflicts. Violence has flared repeatedly as the government has removed poor squatter families from government-owned “protection forests” with the idea that the evictions would protect watersheds.

Protecting watershed functions through reward mechanisms in Sumberjaya may not only solve a local problem, but may also set an important example for approaches that could affect millions of forest squatters in government-owned forests throughout the tropics.

ⁱ With contributions from Noviana Khususiyah, Pratiknyo Purnomosidi, Rudy Harto Widodo, Susanto, Edwin Jonson, and Bruno Verbist. The support of the RUPES Program under the International Fund for Agriculture and Development (IFAD) grant is gratefully acknowledged. The research results reported here is part of that grant.



Watershed function of multistrata coffee

Scientific research suggests that blaming coffee gardens for erosion and degradation of watershed functions results from an incomplete understanding of the underlying issues. Research by ICRAF shows that multistrata coffee farms provide a livelihood to people with few other options and also controls erosion in a way similar to that of natural forest. The multistrata system provides a complex canopy that protects the soil surface from heavy raindrops and also creates tree litter on the garden floor that helps weaken the erosive force of water.^{1,2}

The mixture of tree species in coffee agroforestry systems ensures different patterns of rooting depth that provide good protection of the soil surface and also increase river bank stability.³ A combination of deep-rooted trees for anchoring and shallow-rooted grass with high root density for stabilizing topsoil is generally perceived to stabilize slopes prone to mass movement. Coffee is suitable for anchoring and holding the soil surface at the river bank, but it has a low root length density. Therefore, planting coffee trees with other trees in the coffee agroforestry system is important to stabilize the river bank. The combination of common shade trees (legume) used in the coffee agroforestry system that have shallow roots and a high root density – *Gliricidia sepium*, *Erythrina subumbrans* and *Calliandra calothyrsus* (the tree most frequently used in government reforestation) – with trees that have deep roots, like timber and fruit trees, helps with soil stabilization.

Study Site

Sumberjaya is a sub-district in the Bukit Barisan mountain range (Figure 1). These mountains span the west coast of Sumatra and form the upper watersheds of all major rivers on the island. The 55,000 hectare sub-district almost coincides with the Way Besay upper watershed at between 720 and 1900 meters. The population was approximately 87,350

people in 2004, with a density of about 161 people/km². 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 Besay watershed feeds the Tulang Bawang River (one of Lampung Province’s three major rivers) and also supplies a hydroelectric run-off dam owned by PLTA Way Besay. Electricity generation started in 2001 with a maximum capacity of 90 MW.

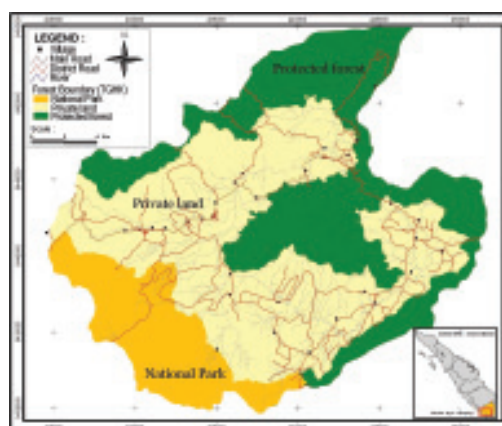


Figure 1. Study site

Conditional land tenure: Indonesia’s experience with community forestry permits

“Today is one of the most important days in my life. I just received my community

forestry permit (HKm). It was not easy and the process took more than two years, but with assistance from RUPES Sumberjaya team, finally I got permission to stay on the land I have been farming,” says Mr. Darmadi, head of the farmer group Wana Makmur. In July 2006, Mr. Darmadi and 500 other farmers were joined by prominent local and national government officials to receive forestry permits. The permits grant land rights to the farmers for a five-year trial period, with possible extensions to beyond 25 years.

The HKm program in Sumberjaya can be interpreted as a form of payment for environmental services that uses secure tenure rather than cash payments as a reward for providing environmental services. The permits represent a major success for these farmers, who are no longer at risk of eviction, but the permits may have an even broader impact. In places where the government owns major forest tracts, community forestry permits, based on conditional land use tenure, can offer a path to improved livelihoods and protection of forest services. This approach works for both production forests and protection forests recovering from deforestation. RUPES learned that the key to using these permits to achieve real watershed function protection lies in strengthening the capacity of both farmer groups and government institutions.

In Indonesia, forestry laws, combined with a decree from the Ministry of Forestry, have authorized community forestry permits (HKm) since 2000. The permits guarantee proper practice by granting the farmers conditional land tenure, if they contribute to watershed health by using good coffee management practices and protect remaining areas of natural forest, they will retain the right to use the land for their livelihoods. However, in 2004 when RUPES first started working in Sumberjaya, only five farmer groups had been awarded such permits and these were for only five-year periods. Covering only seven percent of the protection forest, the area with conditional land use permits was too small to bring measurable improvements to watershed functions.

The RUPES project started working in Sumberjaya with 18 farm groups of about 40 farmers each in their quest for community forestry permits in 2004. The project ensured that all stakeholders were heard, creating essential goodwill among change agents in local and national governments, as well as assisting the farmer groups. Research from the World Agroforestry Center (ICRAF) shows that, without a trusted partner, local people have great difficulty in forming essential relationships with the government and in promoting the dialogue needed for policy change.

On the technical side, ICRAF analyses on river flows and land use cover change kept the technical experts and powerful interest groups from disregarding farmers’



Farmer group leader receives his Community Forestry permit (Photo credit: RUPES Sumberjaya Team).



perspectives. RUPES has also empowered farmer groups and local collaborators through participatory mapping, developing working plans and nursery techniques, strengthening farmer groups, and communicating the emerging reward mechanisms to members of farmers groups. Another key factor enabling the authorization of permits was the development of forest management plans for the area in which the farmers worked, which was agreed upon by both the farmer groups and the district government.

At the July 2006 award ceremony, all 18 farmer groups received community forestry permits. This increased the area covered by the permits from 1,367 hectares to 11,633 hectares. Nearly 6,400 farmers now have permits.

With 70 percent of the protection forest now covered by conditional land use permits, Sumberjaya should start to see measurable improvements in watershed functions. While these improvements have yet to be verified, the permits have already brought about tangible benefits for the farmers.⁴

Recently, RUPES completed a study of the impact of land tenure in Sumberjaya with researchers from Michigan State University and the International Food Policy Research Institute. The study found that the community forestry permits:

- increased land tenure security;
- doubled the local land value;
- reduced corruption;
- increased income, mostly due to a reduction in bribes;
- increased equity, relative to the in-village resources farmers have;
- promoted tree planting/agroforestry;
- promoted soil and water conservation; and
- gave farmers good reasons to protect the remaining natural forest.⁵

RiverCare program: payment for outcomes

The second RUPES project also involves watershed functions. In Sumberjaya, the National Electricity Company (PLN), owner of a hydropower dam (PLTA), is worried about the often high sediment load and supposedly high siltation of the reservoir. The solution for the hydropower electricity company is to keep sediment from reaching the reservoir in the first place. To this end, a community partnership scheme is under development with PLN through a payment for environmental services (PES) mechanism. In response to this, RUPES set up a pilot project within one community



*Community action: reduce runoff speed and trap sediment on path road
(Photo credits: RUPES Sumberjaya Team)*

and one sub-catchment area to develop a mechanism of payment for reducing sediment through the “RiverCare” program.

RiverCare is a community group based around the hydropower reservoir that is responsible for all activities related to water conservation. For the past year, members of the community have worked with RUPES to learn principles related to water conservation, including sediment reduction. They have also constructed and maintained necessary check dams, drainage along pathways and terraces. With RUPES’ help, the members organized themselves into the RiverCare group, taking on responsibility for producing clean water for electrical generation. RUPES supplied the capacity building assistance as well as “seed capital,” paying the group for their work so both the researchers and RiverCare could gain needed experience before approaching real buyers.

In the current experimental learning phase, RUPES as the stand-in buyer and RiverCare as the seller have crafted an agreement that clearly spells out the level of measurable sediment reduction required for specified payment amounts. At the end of the commitment period in 2007, RiverCare will receive US\$ 1,000 for a reduction of 30 percent or more, US\$ 700 for a 20 to 30 percent reduction, US\$ 500 for a 10 to 20 percent reduction, and US\$ 250 for a less than 10 percent reduction.

By the end of the commitment, RiverCare should have a proven product to offer the hydroelectricity company, one that can not only improve the environment, but also lessen the electricity crisis while enhancing community welfare, and that can assess the watershed conservation impacts through monitoring.⁶

Monitoring Activities

The monitoring activities for the conditional land tenure scheme are based on a guideline for monitoring HKm performance, consisting of a scoring system of up to 100 points. The scoring system incorporates concerns relating to institutional criteria (development of a farmer group to manage the permit area), conservation performances (planting trees and conservation practices in coffee gardens), and the overall impact as measured by various social, economic, and ecological indicators. An assessment team will give each HKm area a score which will determine whether and for how long the HKm permit is extended, as follows:

- 35 HKm permit is revoked
- 36-45 HKm permit extended for one year and then re-evaluated
- 46-65 HKm permit extended for five years and then re-evaluated
- 66 HKm permit is extended for 25 years

Regarding the RiverCare pilot project, three aspects of the program are monitored: infrastructural issues, institutional issues, and actual sediment reduction in the river. Infrastructure monitoring relates to the quantity and quality of the new river protection structures. The institutional aspects evaluate the functioning of the RiverCare group and the active participation of its members. The third aspect, monitoring sedi-



ment levels in the river, is of crucial importance, as it is expected that the hydropower dam will only be of interest to a prospective buyer if a meaningful reduction in sediment yield is achieved.

In the pilot project, baseline data were collected in order to quantify current sediment levels before project activities. A sediment rating curve was developed, relating sediment load with discharge. Sampling was also done at various sites along the river to identify the largest sediment contributing areas and erosion hot spots.ⁱⁱ Here, river water samples are taken using a depth integrated method and dried, after which the sediment is weighed in a field lab. Direct readings of visual clarity are made with self-constructed “transparency tubes”, based on the so-called Secchi disc principle. This visual clarity (or Secchi disc visibility), is converted to sediment concentration after calibration with the field lab results. With these methods, the community can monitor the sediment by themselves with assistance from researchers.



*Community Water Monitoring
(Photo credits: RUPES Sumberjaya Team)*

Future challenges and opportunities

Sites exist throughout Asia where the exclusion of local people from forest livelihoods condemns them to poverty. The mechanism of conditional land tenure for improved livelihood and watershed functions is working in Sumberjaya because the head of the district and the head of the Forestry Office for Lampung Barat strongly support this approach. But to make this a long-term mechanism, land use tenure should be made conditional on multistrata coffee farming, as persuasive research has indicated the watershed function provided by this type of management.

ⁱⁱ In the future, samples will be taken approximately every two weeks during a rainfall event from September 2006 to October 2007 to assess changes in sediment load.

RUPES project partners are eager to find stronger conditional mechanisms that tie land tenure not merely to activities, but to actual success in achieving environmental outcomes. With such mechanisms, there would be an opportunity to convince other government officials to embrace conditional land tenure and to give millions of squatter families a chance at improved livelihoods.

Some PES schemes have been set up on the basis of perceived environmental services rather than actual monitored services. The RiverCare program addresses fundamental issues of transparency and conditionality in PES, resulting in payment mechanisms based on clear and measurable environmental services that we expect will be attractive to the real buyer. The goal of these pilot projects is to show the electricity company that buying environmental services can be a cost-effective way for them to reduce the sediment load of the river. We have an ongoing dialogue with the electricity company where we can share what we learn. In a year's time, our objective will be put to the test when the electricity company faces a decision about whether to continue and expand the scheme. Adoption of this mechanism by the hydroelectricity company would not only improve the environment, and probably be more sustainable and cost less than current envisaged measures like dredging, but would also reduce the risk of an electricity crisis and enhance community welfare.

References

- ¹ **Agus F., Gintings A. and van Noordwijk M., 2002.** Pilihan teknologi agroforestri/ konservasi tanah untuk areal pertanian berbasis kopi di SumberJaya, Lampung Barat. Bogor, Indonesia. International Centre for Research in Agroforestry, SEA Regional Research Programme. p. 60.
- ² **Hairiah K., Suprayogo D., Widiyanto and Prayogo C., 2005.** Trees that produce mulch layers which reduce run-off and soil loss in coffee multistrata systems. Alternatives to slash and burn in Indonesia: facilitating the development of agroforestry systems: phase 3 synthesis and summary report. Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office. pp. 9-30.
- ³ **Hairiah K., Widiyanto, Suprayogo D., Lestari N.D., Kurniasari V., Santosa A., Verbist B., and Van Noordwijk M., 2006.** Root Effects on Slope Stability in Sumberjaya (Indonesia)". Paper presented in "International Symposium toward Sustainable Livelihood and Ecosystems in Mountainous Regions. Chiang Mai, 7-9 March 2006.
- ⁴ **Suyanto S., 2006a.** Conditional Land Tenure: A Pathway to Healthy Landscapes and Enhance Livelihoods. Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office.
- ⁵ **Kerr J., Pender J. and Suyanto S., 2006.** Property Rights and Environmental Services in Lampung Province, Indonesia. Presented at "Survival of the Commons: Mounting Challenges and New Realities," the Eleventh Conference of the International Association for the Study of Common Property, Bali, Indonesia, June 19-23, 2006.
- ⁶ **Suyanto S., 2006b.** Clean Rivers, Lighted Lights: Monetary Rewards for Reducing Sediment. Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office.