

Indonesia -Singkarak lake

RUPES in Singkarak Watershed, West Sumatra

SUMMARY

This is a proposal being developed by RUPES to rehabilitate the slopes surrounding Singkarak Lake (western Sumatra), in order to improve its water quantity and quality, both for the communities living around it and for a hydropower company whose electricity production potential might benefit from it. Through a Rapid Hydrological Appraisal developed by RUPES, it has been demonstrated that the usual afforestation/ reforestation campaigns led by the government are not likely to improve the quantity of water and can actually reduce the hydropower production potential. In this way, RUPES is supporting rehabilitation through agro-forestry.

MATURITY OF THE INITIATIVE

Under implementation. RUPES is carrying out hydrology to assess the most appropriate land use changes to introduce for the rehabilitation of the slopes of the lake for the provision of watershed services. Negotiations with stakeholders and valuation studies are also taking place to design a reward scheme between providers and users.

The potential for supply of carbon services, at Singkarak Lake, is also being assessed by the Japanese International Forest Promotion and Co-operation Centre (JIFRO)

DRIVER

Interest to rehabilitate highly eroded land land around Singkarak lake due to fluctuations in the level of the lake and worsening of its water quality.

Recent power failures in West Sumatra's hydroelectricity supply have been blamed on deforestation attributed to small-scale farming in the Singkarak catchment. But according to van Noordwijk and Agus (2004) the real cause is the lack of rain.

Flood and landslide control is also an expected benefit of the rehabilitation of the catchments.

There have been previous rehabilitation initiatives, such as the "Million Trees Planting Programme (*Penanaman Sejuta Pohon*)", in 2003, but hydrological studies carried out by RUPES have shown that these may in fact contribute to a reduction of the water quantity available.

STAKEHOLDERS

Supply

Local community in Tanah Datar district, surrounding Sinkarak Lake.

The current plan involves the rehabilitation of 540 ha of critical land every year, during five years, to cover about 2,700 ha of critical land.

Demand

Initially, the plan is to engage the state-owned hydroelectric Company (PLTA Singkarak) and at a later stage other water users like irrigation users of the Inderagiri river, fisheries and recreation users). Other likely sources of funding would be Clean Development Mechanism partners.

Intermediary

Unclear at this stage

Facilitators

RUPES. Developing Mechanisms for Rewarding the Upland Poor in Asia for the Environmental Services they Provide (ICRAF/SEA)

MARKET DESIGN

Service

Run off control and flow regulation into the lake, to reduce landslides and floods and improve hydroelectricity production.

Water quality to reduce weed infestation and curb the decline of the indigenous fish population in the lake.

Carbon sequestration

Commodity

Best Management Practices through agroforestry (mainly shade-grown coffee and fruit trees) in community *Adat Land*.

Rehabilitation of degraded ecosystems by replanting native trees in the state-owned protection forest. Through this scheme, the tree species used are to be native, instead of fast-growing species, supported by the government's Million-tree planting programme

Payment Mechanism

Unclear.

van Noordwijk (2006) suggests that current payments made by the hydroelectric company PLTA to the local government as water tax can, in part, be seen already as rewards for maintaining or improving environmental services with various types of rationale, on which the PES scheme could build. . These are:

- Compensation for damage caused by the HEPP project, to the farmers along the Ombilin river with waterwheel irrigation systems and to farmers with rice fields surrounding the lake affected by increased flooding;
- Shared responsibility for maintaining the water quality in the lake as the HEPP project has modified outflow rates and increased debris accumulation;
- Tax payments to local government;
- Goodwill enhancing payments to the local community;
- Payments for environmental services conditional on the delivery of these services." (However, the author highlights that "evidence for the last component is relatively weak").

Terms of Payment

Potentially this will involve a Charity-Loan system where communities receive financial support for economic activities as loans. If they fail to fulfil their environmental improvement and protection commitments these loans have to be repaid, otherwise they are given as a grant. Boer (2005)

Funds Involved

Unclear.

ANALYSIS OF COSTS AND BENEFITS

Economic

The Rapid Hydrological Assessment, conducted by RUPES revealed that by "reforesting all lands the total inflow to Singkarak will decrease and will cause 5% reduction in electricity power plant operation." Boer (2005). Improved conditions for fisheries in the lake, particularly for the endemic *ikan bilih* fish.

The HEP may also benefit from avoided costs in turbine maintenance due to a reduction in weed infestation in the lake's waters.

Environmental

RUPES hydrological studies in Singkarak suggest that reforestation with fast-growing evergreen trees (like the native *Pinus merkusi*) as has been done in past "regeneration campaigns" of the degraded slopes, might in fact lead to a reduction in dry season flows, which may have a mildly negative effect on water volume usable by the hydropower company.

Social

This project is expected to raise the government's awareness for the need to guide its environmental protection investment by the user pays/provider gets principle, in general. Boer (2005)

As part of the negotiations for the PES, conflict of interests between the hydropower and the downstream community (due to low flows in dry season) is expected to be discussed and ultimately resolved.

LEGISLATION ISSUES

MONITORING

It is unclear how the project will be monitored. It is important that results and feedback are provided if the communities are expected to pay the initial investment back.

MAIN CONSTRAINTS

The challenge is how to develop the capacity of the local stakeholder (human resources and institutional capacity) to participate in such mechanisms.

It is difficult to see how the hydroelectric company would be interested in paying (or contributing) towards activities that will result in reduced water flows into the reservoir, regardless of potential reductions in sediments.

MAIN POLICY LESSONS

OTHER INFORMATION

RUPES has developed a methodology to assess the opportunities for land use agreements and rewards for watershed services, in upland areas- the Rapid Hydrological Appraisal. This tool provides a step-by-step scoping exercise that includes step-by-step guidance to conduct a rapid appraisal of the hydrological situation and assess the perception of key stakeholders regarding reward opportunities. This manual is available in RUPES website

(<http://www.worldagroforestry.org/sea/Publications/currentpub.asp?publishid=1438>)

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REFERENCES

Boer, R. 2005. personal communication with Dr. Rizaldi Boer, Bogor Agricultural University

Leimona, B. and Prihatno J. 2005. Getting started before you begin: experiences from environmental service benefit transfer schemes in Indonesia. ICRAF and Directorate General of Environmental Services and Ecotourism Planning, Ministry of Forestry of Indonesia. Seminar on Environmental Services and Financing for the protection and sustainable use of ecosystems. Geneva, 10-11 October 2005, Convention on Protection and Use of Transboundary Watercourses and International Lakes, UNECE. Discussion Papers. http://www.unece.org/env/water/meetings/payment_ecosystems/Discpapers/Beria_ICRAF_Indonesia.pdf

Jeanes, K. van Noordwijk M. Joshi L. Widayati A. Farida and Leimona B. 2006. Rapid Hydrological Appraisal in the context of environmental service rewards. Bogor, Indonesia, World Agroforestry Centre - ICRAF, SEA Regional Office .

<http://www.worldagroforestry.org/sea/Publications/currentpub.asp?publishid=1438>

van Noordwijk, M. 2006. Rapid Hydrological Appraisal (RHA) of potential for Environmental Service Rewards: procedure and application in Lake Singkarak, West Sumatra, Indonesia. ETFRN- European Tropical Forest Research Network Newsletter Forests, Water and Livelihoods, 45-46 Winter 2005/06 . <http://www.etfrn.org/etfrn/newsletter/news4546/index.html>



Van Noordwijk, M. and Agus F. (2004) Dam-busting forest, water 'myth-understandings'. 8-12-2004. RUPES- World Agroforestry Centre. RUPES website.

<http://www.worldagroforestry.org/SEA/W-New/OpinionJktPost-ASBForestWater.pdf>

S.Suyanto, Beria Leimona Rizki Pandu Permana and Fiona Chandler. 2005. Review of the development of environmental services markets in Indonesia. Bogor-Indonesia, World Agroforestry Centre (ICRAF). RUPES Working Papers.

http://www.worldagroforestry.org/sea/Networks/RUPES/download/Working%20Paper/ReviewMarketESIndonesia_Final.pdf

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<http://www.worldagroforestry.org/sea/networks/rupes/>