



# Rewarding Upland Poor for Ecosystem Services in Indonesia

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“The royalty payments in Lake Singkarak are not as pure as the payments for ecosystem services (PES), which are market based. It was more of an investment in conserving the watershed... Maybe the pure PES concept did not work in this case but it seems that the buyer was willing to invest [to] maintain the good quality of the landscape.”

- Beria Leimona,  
Environmental Economist - RUPES Project Coordinator

A **royalty** is a payment made to an owner at regular intervals for the use of natural resources, property, copyrighted works, or franchises. In this case, the hydropower plant pays the Indonesian government royalties to be able to produce electricity using the lake's water.

## Lake Singkarak

Lake Singkarak, a stunning lake located in West Sumatra, Indonesia, has long supplied surrounding communities with abundant natural resources. Lake Singkarak occupies an approximate area of 107.8 square kilometers and harbors an endemic fish species, Ikan Bilih. However, population growth, forest depletion, and hydropower electricity generation, have led to the degradation of the lake and its surrounding landscape.

The area is now home to more than 400,000 individuals, and 13 Nagaris (villages that adhere to the traditional system of governing of the area). Water is drained intensively to support the rice fields bordering the lake and timber harvesting to support mining efforts during the colonial era has led to low forest coverage in the area. Government reforestation programs, for the most part, have been unsuccessful due to the top-down nature of the policies they introduce.

The construction of a hydropower plant in the 1990s altered the lake's out-going river flow, and modified water levels, causing lake banks to collapse. Both lake bank collapse and long dry spells halt electricity production and disrupt the community's livelihood activities. The electricity generated by the hydropower plant powers the surrounding communities, as well as the Western Sumatra and Riau provinces, and supports an approximate population of 9 million electricity users.

RUPES (Rewarding Upland Poor for Environmental Services) works with the hydropower producer and Nagaris to draw attention to the land use changes caused by the degradation of the lake's resources, and to create incentives that will curtail these land use changes and facilitate the development of an appropriate land use management framework .

## The Project

Indonesian law dictates that the hydropower plant must allocate 35% of total royalties to local areas; however, in Lake Singkarak, these funds never trickled down to the Nagaris surrounding the lake, whose livelihoods are directly affected by the hydropower electricity generation. RUPES worked closely with Nagari Paninggahan to make sure that Nagari Paninggahan actually received a share of the royalties paid by the state-owned hydropower producer. In return, Nagari Paninggahan citizens agreed to undertake a reforestation project in order to improve watershed services in the area. Originally, erosion was assumed to be the key factor in decreasing water supplies, and that payments for reforestation would be

the major solution. However, upon conducting a hydrological study, natural precipitation variability and climate change were discovered to be the main drivers that decreased water quantity and quality. Based on this information, the contract was augmented from payments for watershed services to landscape beauty. In 2005, the hydropower plant paid the community US \$40,000 as compensation for altering behavior in order to provide land rehabilitation in Nagari Paninggahan.

“The hydropower plant has a limited budget and is unable to fully compensate all 13 Nagaris. We cannot say this is a defect or failure of the PES scheme, but the lessons we can learn are about environmental awareness and to be better environmental stewards.”

- Beria Leimona,  
Environmental  
Economist - RUPES  
Project Coordinator

**Leakage** occurs if conservation of the targeted ecosystem service shifts environmental degradation to another area, thereby offsetting the benefits of conservation efforts.

## Challenges and Successes

Payment for ecosystem services (PES) are based on the premise that a “buyer” is willing to pay for a “well-defined ecosystem service” provided by a “seller”. In this case, both buyer and seller, the hydropower producer and Nagari Paninggahan respectively, initially assumed that payments would be based on watershed services. However, the hydrological study conducted demonstrated that Nagari Paninggahan, could not provide this service. An initial assessment of the ecosystem services provided would have been helpful to assess the feasibility of a payments for watershed services scheme, thus meeting the criteria of “well-defined ecosystem service”. In this case however, both buyer and seller were flexible, and amiably agreed to change the ecosystem service provided from watershed services to landscape beauty. In a rudimentary sense, the payments obtained from royalties can be seen as payment for ecosystem services, in which, the ecosystem service provided is maintaining the quality of the landscape.

RUPES’ collaboration with the various stakeholders was important because it allowed these royalties to benefit one of the affected

Nagaris, and highlighted the importance of land use activities in this community. RUPES endeavors also facilitated the development of a consensus-building process over activities that could be pursued to improve local livelihoods, natural resource management, and environmental services. RUPES successfully shifted the top-down approach of reforestation policies in the area, to a more flexible, collaborative approach. Under this new management policy, Nagari Paninggahan applied for a grant to revive their traditional mixed agroforestry. One of the examples in improving their traditional mixed agroforestry is to establish a coffee plantation system in the upper part of the watershed. If proven successful the Nagari Paninggahan could participate in the organic coffee markets, and obtain other sources of income that support sustainable land-use management.

Moreover, due to the success of Nagari Paninggahan and the implementation of the new management policy, two of the Nagaris have established their own representative organizations to serve as a liaison and continue discussions with other stakeholders.

## Looking Forward

RUPES is currently working with Nagari Paninggahan to discover creative livelihoods that generate income for community members, while providing environmental services. Aside from assessing the feasibility of eco-friendly coffee cultivation, Nagari Paninggahan is attempting to obtain financing through the voluntary carbon market for their carbon sequestration services, and grant funding to support the sustainable harvesting of the acclaimed local delicacy, Ikan Bilih, an endemic fish species to the lake. This attempt to provide bundled ecosystem services will allow Nagari Paninggahan to significantly enhance their economic situation.

RUPES is attempting to secure participation with all 13 Nagaris to ensure that they also receive payments for landscape services and to create an institutional framework and governance structure that fosters sustainable livelihoods. This not only ensures that payment for ecosystem services are dispersed equitably, but also ensures no leakage will occur.

RUPES is also working to educate and increase awareness regarding the utility of adopting sustainable land use practices. Many in the Nagaris continue to be unaware of the connection between land use and ecosystem services such as water quality.