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Lake Singkarak: the RUPES project

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Background

Singkarak, with its beautiful lake, is a former Minangkabau kingdom. The region is well known for its unique blend of religion and culture. Lake Singkarak is an important source of water for the surrounding agriculture and provides water and electricity for many parts of West Sumatra province. It is also the home of an endemic fish species (*Mystacoleucus padangensis* or 'ikan bilih'), a famous delicacy.

The system of governance was changed after the reign of Soeharto from village into 'nagari' as part of the decentralization process. The nagari system recognizes the traditional effectiveness of local communities in managing their natural resources. In Singkarak, 13 nagari are located around the lakeshore with the boundaries coinciding with the hydrological sub-catchment. The lake, however, belongs to two different districts: Solok and Tanah Datar. Currently, more than 400,000 people living on Singkarak's shores and are highly reliant on the lake.

Logging activity in the past time has created thousands of hectare of bare lands, which have not yet recovered. Agricultural activities in the uplands have encouraged infestations of 'alang-alang' grass (*Imperata cylindrica*) in some parts.

Previously, many scientists pointed to erosion in Singkarak as the key problem, with reforestation of the grassland as the main priority for enhancing environmental services, particularly to increase water supply. However, RUPES' exploration of water-balance models, local ecological knowledge and preferences in the local policy discourse revealed that reforestation might not be the single solution. A survey carried out by RUPES showed that the change of inflow into Lake Singkarak was also caused by the rainfall pattern as well as a hydropower plant.

The development of hydropower in the 1990s brought major changes to the lake's outlets and modified the pattern of rise and fall of the lake. The lakeside communities, for example, have experienced significant decreases in outflow to the Ombilin River during the dry season. The water gate is closed during this time to maintain water levels in the lake. This has disrupted local communities' livelihoods that depend on the water from the lake.

Indonesian law obliges State-owned companies to distribute royalties to both national and local governments. Thirty-five percent of total royalties, which can also be seen as payments for environmental services, should go to local districts via the provincial government. In the past, the royalties did not reach local people who suffered from the impact of hydroelectricity generation on their livelihoods. As well, the allocations were not designed as incentives to enhance environmental conditions nor were they transparent enough for local communities to be able to improve their livelihoods. At the same time, the communities found that the water quality and inflow of pollution had reduced fish stocks and other direct use values of the lake.

Objectives

RUPES argued that the communities surrounding the lake should receive benefits from the royalties for the environmental service they have provided.

Thus, to present a clear link between land use and environmental services, as well as to facilitate the emergence of appropriate institutional set-ups for managing land use, were two of the objectives in Singkarak.

About RUPES at Lake Singkarak

RUPES tried to ensure that the communities who were willing to participate and took the initiative to protect and improve environmental quality would receive rewards and compensation. It was expected that the local governments and private sector organizations which received benefits from environmental services provided by the communities in Singkarak would follow appropriate principles when distributing their budget to the communities. The system was also expected to increase communities' participation in protecting and to improving their environment.

During the first phase, RUPES focused on supporting and building the capacity of local communities, institutions and government agencies in Singkarak. We emphasized the implementation of environmental services' schemes to promote sustainable natural resources management and poverty alleviation among poor upland communities.

In the second phase, which is still continuing, RUPES' work in Singkarak is focused on the engagement of stakeholders in pro-poor environmental services schemes, including buyers, investors and the intermediary agencies. Innovations in environmental schemes become the major approach of RUPES. We expect to provide some support for developing a national policy framework for voluntary, realistic, conditional and pro-poor rewards for environmental services scheme.

Flowing the money to the communities

Together with the hydropower producer and local communities, RUPES established a scheme to distribute royalties. This not only benefited the communities through the improvement of their economic condition but also provided certain advantages for electricity production. In 2005, Nagari Paninggahan received almost US $40,000 from hydropower royalties, or roughly US $1 per person per year. This system provides a model for application elsewhere since it includes compensation for damage caused to livelihoods to the nagari bordering the lake and also to relatively poor nagari. The funds are intended to provide incentives to maintain environmental conditions. The amount of royalties received depends on the amount of electricity produced thus the stakeholders in return have a strong interest and responsibility to support the better performance of the hydropower company.

Rehabilitation of 'hulu' coffee garden

Preliminary analysis by the Indonesian Coffee and Cacao Research Institute showed that the robusta coffee population in the valley is highly variable, as expected from a seed-based coffee establishment, but contains 5–10% of high-yielding trees that can be used for grafting on existing rootstock after pruning.

Nagari Paninggahan is currently revitalizing a 100 hectare, old coffee area, which is a small proportion of the total of over 1000 ha inside their customary forest. They use organic coffee production rules, benefiting from 50 years of no fertilizer input for securing clean water flow into the Lake Singkarak downstream. The revitalization of the coffee plantation is intended to be an alternative livelihood for the communities.

However, some problems need to be solved. One of them is related to land status. The area's earlier status was as an enclave, which recently was changed by the district government into protection forest. Also, providing comprehensive scientific data on the role of the rehabilitation in relation to biodiversity, water quality and the landscape as a whole is further work that needs to be done in order to gain more acceptance from local government and the communities. To achieve this, RUPES will

establish a pilot plot that maintains environmental protection and optimizes communities' income, based on the premise that better management will also improve the environment.

Clean Lake Singkarak program

Some problems have emerged in the Lake Singkarak area, such as the increasing amount of garbage and other pollution in the lake, decreasing catches of ikan bilih, lake-bank abrasion, sedimentation in the estuary, and a rapid increase of settlements alongside the lake. These problems triggered the idea of creating a cleaner lake for the communities.

The program brought together all stakeholders involved in management of Lake Singkarak to agree on efforts to improve the lake's condition. Four local governments (Solok district, Solok city, Tanah Datar district and Padang Panjang city) committed to creating programs to clean the lake. This has opened opportunities to expand the program nationally through the Lake Priority Program conducted by the Ministry of Environment. In addition, the communities also established working groups, one of the aims of which is to provide extension programs about the importance of a clean lake for their lives and for those of other communities.

Rehabilitation of grassland into agroforestry through the Voluntary Carbon Market

Marginal land around the lake had the potential to be linked with a carbon sequestration and storage system through reforestation and replanting. One of the systems introduced in Singkarak was the Voluntary Carbon Market (VCM). VCM is expected to provide a flexible and accessible system for developing as well as developed countries. Through this system, reducing emissions of greenhouse gases from the developed world will be easier to achieve and could also improve economic development and environmental conditions in developing countries.

RUPES and CO2OPERATE BV from the Netherlands have initiated a VCM system in Nagari Paninggahan. So far, 50 hectare of land has been registered to the program and planted with various tree species, including fruit, to develop an agroforestry system. The program involves more than 50 households who believe that they will benefit not only with greater incomes but also from their participation to protect the environment, both at the local and global levels.

Replication of the system in other communities around Lake Singkarak, or other places, is possible. However, some points need to be addressed, including clear and transparent mechanisms, full support from all stakeholders involved at local and national levels, and trust among the stakeholders. These will guarantee the success and sustainability of the program in the future.

Environmental Education Centre proposal

In order to integrate RUPES' projects in Singkarak, as well as to provide a comprehensive and sustainable action to protect the lake, an initiative emerged to establish an Environmental Education Centre (EEC). The EEC is planned to be a centre of knowledge as well as a strategy to assist environmental education becoming closer and integrated with local communities' daily lives. RUPES argues that environment education is required, particularly for the younger generation because they will be the main actors in the future management of their own natural resources. In addition, the centre will provide information regarding (eco)tourism in Singkarak and the cultures of the Minangkabau people.

In the future, the centre will provide curriculum-based knowledge and skills to students, provide high quality teaching and direct access to RUPES' programs in the field. An environmentally friendly building is also planned.

Supporting local and national policy frameworks

All RUPES' projects in Singkarak are aimed at supporting policy at both local and national levels. With the rehabilitation of the hulu coffee garden, the Government is expected to decide on an appropriate policy by considering both the ecological and economic opportunities for the communities. The VCM in Paninggahan is relatively new and unavoidably uses a 'trial and error' mechanism.

The lessons learned from this process will contribute to the establishment of relevant policy related to climate change. Later, the clean lake program also require higher level policy development and implementation because the lake is located in two districts with different customary structures and behaviors. Thus, a culture-based policy will also be an important way to achieve the objectives of the program.

Improving the engagement of national and international stakeholders in rewards for environmental services schemes

The VCM in Paninggahan will not be the last scheme implemented in Singkarak. Other areas are waiting to replicate with a similar scheme. Finding potential buyers, both national and international, is another task for RUPES. In addition, Government engagement will be another crucial factor for the success of this scheme. However, participation by other buyers and investors is also required to make the hulu coffee garden and clean lake programs work.

Developing innovation in effective, efficient and pro-poor rewards for environmental services schemes

The program developed by RUPES in Singkarak provides some basic lessons for developing better and innovative rewards for environmental services schemes. The hulu coffee garden provides basic information to develop a mechanism that balances environmental and economic interests. The VCM is the first scheme to establish a contract between the communities as the service providers and the buyers, not only in West Sumatra but also in Indonesia. Finally, the clean lake program could be the initial stage of developing better lake management with integration of social, economic, educational, infrastructure and environmental issues.

Reading materials

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