

In Kulekhani, Nepal, a hydroelectricity scheme that used to rely on 'command and control' relations with the upland communities in their catchment now face more critical 'sellers'

Kulekhani which means 'mine of water' in Nepali lies only 50 kilometers from Kathmandu, Nepal's capital city. The watershed provides 17 percent of the country's hydropower. Kulekhani is one of 15 similar hydropower projects in Nepal and it may well be the starting point of a new era in the relationships between upland communities in the catchments that feed hydroelectricity plants and the companies that turn waterflows into sustainable energy and profits.

Designed in the 1980's and constructed in several phases, Kulekhani represents a generation of projects that accounted for social aspects and environmental conditions of the uplands, at least in theory. In 1993, rainfall as only expected once in 100 years washed a lot of soil into the reservoir, reducing its expected life time by one third. Authorities blamed deforestation and erosion of the uplands. In fact, to save money the contractor had partially excavated a hill above the reservoir for earth for the dam, and the heavy rains washed the rest of the hill into the reservoir.

The 45,000 residents of the Kulekhani watershed, as the majority of people in Nepal, depend on their forests for fuelwood, fodder for livestock, forest litter as source of organic fertilizer, medicinal plants and timber. Many of the poorest people of the upper watershed earn their livings



View on the Kulekhani watershed against the backdrop of the snow-covered Himalayan range

by collecting and selling medicinal herbs and shrubs. Nationalization of forests in the late 1950s preceded a major sell-out logging phase that led to massive deforestation in Nepal. Two decades later, the government handed over the responsibility for forest conservation to local communities giving them management and limited-use rights.

Because the government deemed Kulekhani lands as 'critical watershed of strategic importance', it took a more proactive role through 'participatory watershed conservation programs'. These programs employed

local people to plant trees, and build walking trails, schools, and health posts. The programs also built small check dams and adopted measures to control gullies. The government planted large areas in both state forest and on village lands with pine tree monocultures. Free seedlings and strong extension messages convinced villagers that they would benefit as well from planting these trees on their lands in combination with terrace construction. These plantings required farmers to switch from tradition fallow rotations to permanent-field agriculture and from free-roaming cattle to stall-feeding of animals.

From the company's perspective, their strategies have led to success. Sediment-trap dams constructed in the catchment to intercept any sediment before it reaches the reservoir do not have to be emptied as often as

expected, springs on the hillsides started to flow again, there are reports of increased dry-season flow into the reservoir. Annual electricity production has met the target even though the lake does not have enough storage capacity in years with a prolonged dry season. The company is satisfied. But what is the perspective of the villagers in the catchment area? Given the top down approach to watershed management, no one from the government or hydropower company knew.

The state hydroelectric company by law pays royalties to the central government that then channels some of the royalties to the districts. However these payments are seen as a mix of 'compensation', corporate social responsibility and tax not as conditional, voluntary and realistic payments for environmental services obtained.

RUPES Kulekhani set out to enhance the linkage between the providers of environmental services and the beneficiaries, to increase the benefit flows the payments for environmental services and to set an example for more transparent, fair and efficient relationships elsewhere. It obtained some surprising results.



Collecting the 'chiraito' shrub (Swertia chirata) for medicinal use

What needed to be done in Kulekhani?

Mobilize and Empower Stakeholders

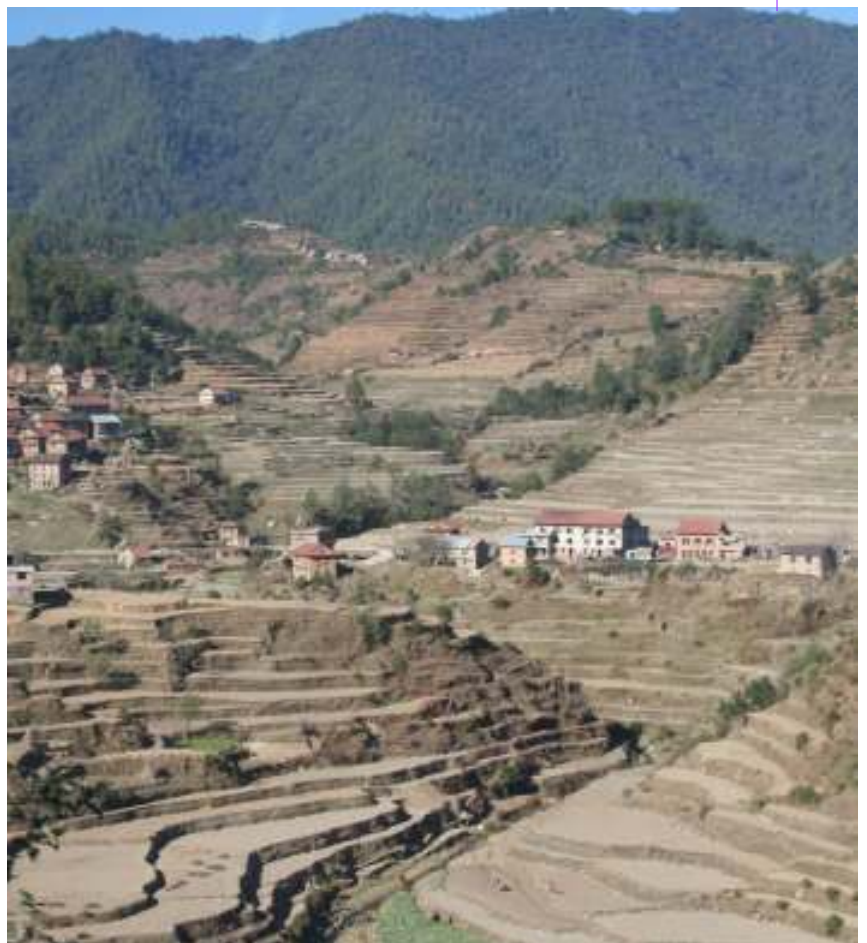
Upland people were not aware that their conservation activities had actually created environmental services valuable to a third party. At the same time, beneficiaries (buyers) did not appreciate the importance of the services they received and the opportunity costs that the watershed conservation entails for the upland community. Because of this, the RUPES Kulekhani strategy called for mobilizing upland communities to see themselves as sellers of environmental services and enhancing their capacity to negotiate with buyers. Awareness and capacity building activities aimed to educate buyers and sellers about the importance of environmental services.

RUPES Kulekhani also worked directly with policymakers and encouraged them to develop policies favorable to the implementation of mechanisms for payments for environmental service.

Identify Potential Rewards and Transfer Mechanisms

Forest restoration and conservation in Kulekhani watershed by the upland people has reduced sedimentation in the reservoir and thus enhanced the expected lifespan of the facility. There are indications, though not yet confirmed and analyzed relative to rainfall, that it also increased dry-season water flow into the Kulekhani reservoir thereby increasing electricity revenue of the hydropower company. By law, the company must pay a

portion of its revenue as a royalty to the central government of Nepal. Also by law, the central government must share its royalty with the local government of the district housing the hydropower plants which in this case includes the catchment area as well. In the case of Kulekhani, the royalty share goes to the Makwanpur District Development Committee (DDC). Thus, the hydropower company, the central government, and Makwanpur DDC all benefit from the hydrologic services that Kulekhani conservation activities provide making all three potential buyers.



All agriculturally used land is terraced

RUPES evaluated three alternative mechanisms of reward transfer:

- The hydropower company could directly pay a portion of its revenue from sales of Kulekhani electricity to the upland people for their environmental services.
- The central government of Nepal could allocate a portion of its hydropower royalty from the Kulekhani hydropower plants to the upland communities.
- Makwanpur DDC could set aside a portion of its hydropower royalty from the central government for the upland communities.

After formal assessment of the current socio-political scenario and existing laws and regulations in Nepal, RUPES identified the last alternative as the most feasible and pursued this route.

RUPES Kulekhani Action Research Goals and Objectives

The goal of the 3-year project which started September 2003 is to build the capacity of local communities, institutions, and governmental agencies in the Kulekhani watershed to identify and utilize rewards from environmental services to promote sustainable natural resource management and poverty alleviation among poor upland communities. The main objectives of the project are (1) to identify and value environmental services provided by the Kulekhani watershed and identify potential suppliers and buyers of these services, (2) to identify appropriate environmental services reward transfer mechanism, (3) to strengthen the capacity of local organizations to implement reward transfer mechanism, and (4) to disseminate lessons learned.

What worked? Nepal Receives Electricity, Upland People Receive Payment

The upland communities receive a royalty share

In late 2006, the Makwanpur DDC deposited a first installment of US\$6,850 (of the allotment of US\$54,795 for 2006-07) in a new Environmental Management Special Fund (EMSF). Deposits for all 2006-07 will total US\$54,800. The EMSF is managed by a newly established group made of representatives from the Kulekhani communities. The EMSF receives 20 percent of the royalty share of Makwanpur DDC, and will support conservation and development programs proposed by the communities. A committee of stakeholders including representatives from the suppliers and beneficiaries of environmental services will select the proposals to be supported by EMSF.

Kulekhani communities find a voice and envision the future

Strategies to empower the local communities worked very well. With RUPES support, the communities formed the Kulekhani Watershed Conservation and Development Forum. With the Forum, the communities will participate in shaping the future they envision by managing the hydropower royalties allocated to the EMSF and fully participating in watershed planning not just in the implementation of plans made elsewhere. Improving road access is an expressed priority.

With the experience and training from RUPES, the communities also found a voice. From RUPES training, the Forum developed an understanding of concepts of environmental functioning, the ability to negotiate with company and government officials, working knowledge of laws and regulations related to hydropower royalties and expertise in the application of the communities' rights and responsibilities regarding the use of natural resources of their area. This

knowledge and social capital has caused the community to question of decisions previously made for them rather than with them.

A decade ago, the government and the electrical authorities took the classic, top-down approach to managing Kulekhani's dam and operations. Without consulting the local people with the most intimate knowledge of the land and its workings, the authorities promoted sediment control techniques planting pine trees because they grow easily. Now, the villagers have started to question the dominance of pine trees, as other trees are more useful to them as source of fodder. They also realize that they need specific permission to cut down trees they planted themselves on their own lands. The pine trees have brought the return of forest animals that they feel threaten their children and their crops. In addition, they note dry ground under pine trees, when land under broadleaf trees stays wet. They wonder if seemingly increased water supplies originate from the remaining natural forest on the upper slopes that are now used less intensively and may have recovered infiltration. They see the pine trees as, in fact, drying up the soil.



Collecting fodder and firewood

What's Next?

Institutionalizing transfer payments and their use. For now, the decision to transfer 20 percent of hydropower royalties to the EMSF is a one-year-only decision. Makwanpur DDC will review the decision next year and decide whether to continue this mechanism. Since Makwanpur DDC is a political body, any change in the political scenario will influence the decisions it makes. Hence, RUPES Kulekhani needs to continue its support for social mobilization, awareness building and capacity enhancement to institutionalize the reward transfer mechanism.

Ensuring proper use of money is also a challenge. Makwanpur DDC has sought assistance from RUPES for the assessment of development needs and aspirations of upland people of Kulekhani watershed and for preparation of a conservation and development plan. Both Makwanpur DDC and the Forum need support to build their capacity to identify projects to be funded by the EMSF.



The pines promoted by the government in the past, are of no value to us. We prefer broad-leaved trees that provide fodder for our animals.....

Are Payments for Environmental Services Sustainable?

In Kulekhani a need for More Listening, More Empowering, More Research was identified. The payments from hydropower royalties amount to about US\$1.50 per person per year, enough to fund community development projects but not enough by a factor 100 to dent poverty as such. This brings up the question of how much payments for environmental service can actually achieve. Initial indications from Kulekhani suggest that payments for a single service will not be enough either for conservation or development. However, the Kulekhani work also indicates directions to look for improving on this record.

One direction is to research methods for choosing the right trees for the right place. Consultations with the Kulekhani communities

before promotion of pines could have resulted in tree plantings that fed livestock and provided superior watershed services. Community members could have increased their incomes from two sources the hydropower royalties and livestock sales. This kind of layering or bundling of values may be necessary for environmental services to offer a path to either conservation or development.

Furthermore, input from the people actually managing the resources points to important new research directions. While the people say soil under pines stays dry, they also say that springs have appeared where they never existed before. RUPES research in other areas says that pines reduce rather than increase water supplies. So, what does the conflicting evidence of dry soil and new springs mean in Kulekhani?



The reservoir created in the early 1990's

There are small Tamang communities who live at higher altitudes and make their living from gathering various products from the high altitude forests. These forests are important for water catchment and storage. So far these communities of upland poor have not been included in the negotiation for payments for environmental services. Future discussions need to address the problems, needs and perceptions of these communities.

Kulekhani can truly become a start of new relations beyond the 'command and control' era, and inspire changes elsewhere.



Farmer group discussion utilize the shade of trees

