

**Economic & Political** WEEKLY



**Economic and Political Weekly**

Published by: Economic and Political Weekly

Stable URL: <http://www.jstor.org/stable/4410918>

**Conflict in Resource Management for Ecosystem Services: Water in Lashi Watershed,  
Lijiang**

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# Conflict in Resource Management for Ecosystem Services Water in Lashi Watershed, Lijiang

*Water supplied free to urban centres imposes costs on the upland watershed. The paper analyses the conflicts and costs of such provision of external ecosystem services in a case in Yunnan, China. It argues that in order to internalise the external costs of such water supply, there should be a locally embedded system of forest management. It further argues that pricing of these external ecosystem products, like water, is needed to enable local communities to balance the benefits from their sale against costs and other benefits.*

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Lashi watershed is eight km away from Lijiang town, famous as a world cultural heritage site and now the most popular tourist destination in south-west China. The basin-shaped valley is surrounded by mountains with elevation ranging from 2,500 to 3,840 metres. Lashi is an integrated watershed, clearly marked out by a basin, which drains water from the hill-forests into Lashi Lake, which is also home to a large number of rare migratory birds in winter.

The watershed has a population of just over 18,000 people in about 3,250 households. The economy is a combination of agriculture (wet rice and dry crops, like wheat and maize in the valley and potatoes and buckwheat in the uplands), a growing horticulture in former dry land crop lands, along with lake fishing and animal husbandry. Until the 1998 ban on logging, timber provided a substantial part of cash income, particularly for those in the

demand for timber in the 1980s and 1990s spurred the growth of logging. The Naxi, better placed in the lowlands and with access to more resources (labour and animals) carried out logging on what may be called 'medium scale' (non-mechanised). The Yi, on the other hand, were restricted to artisanal logging. While the former therefore benefited more from logging, they also benefited from the use of water in paddy fields and fruit orchards, and even from taking so-called degraded lands on lease for fruit tree cultivation.

Some of the income from logging was used by better-off Naxi to change their livelihood system. The livelihood pattern of the Naxi has changed with more income from fruits and cash crops. The effect, however, has been to turn the former winter slack season into another busy season for women, who use this non-agricultural season to collect firewood and pine needles

dry season. This along with deterioration in the quality of water in the lake led to a fall in the birds wintering on the lake.

In order to deal with the problems faced in the provision of external ecosystem services (i.e., those ecosystem services supplied to the external world, outside the Lashi watershed), the provincial government initiated three resource management programmes: wetland nature reserve (1998), water transfer project (1994) and ban on logging (1998). All these resource management projects have serious repercussions on the local population. There is a loss of income from logging. Water supply requirements keep the water levels of the lake at a level that floods an area of cropland. Fishing is affected by the wetland reserve policies. While the very success in improving the quality of water supply has increased the lake's attraction to migratory birds, this has the negative local effect that there are more crop losses

uplands. The main non-timber forest products (NTFP) are many varieties of mushrooms, including the high-priced *songrong* (*mashtake* in Japanese). Overall per capita income (1998) is just above the poverty line, but 10 per cent of valley and 90 per cent of hill-dwellers are below the poverty line. The Naxi, who live in the valley, account for 94 per cent of the population, while the Yi in the hills are just 6 per cent.

In the period of socialist construction, since Lashi was close to Lijiang, it was logged quite extensively. Over the 1980s and 1990s, with devolution, there was household logging and conversion of forest into agricultural lands. The growth in the

from the forest. Men, on the other hand, still relax and visit each other in winter.

The forests, however, are important not only for the timber they contain, but even more so for their water supply and flood control function. The forests trap and release water over time into the lake in the valley. Besides supplying water for irrigation for paddy fields in the valley, it also supplies water to Lijiang town. Concentrated logging in some areas, led to a marked deterioration in the water supply and regulation function of the forests. There was an accelerated silting of the lake bottom. Runoff during the rainy season increased, leading to flooding of fields. On the other hand, there was a shortage of water in the

to these birds.

The benefits, from these resource management projects, on the other hand, flow more to the external world. The biodiversity benefit of an improved habitat for migratory birds is global. Increased water is supplied to Lijiang town free of charge. The likely future flood-control benefit of the logging ban will be to an extent local, but also more for the plains of China.

With the area's per capita income just above the poverty level, and with most of the upland Yi well below the poverty line, it is necessary to ask the question whether the commoditisation of forest-based, eco-system services (rather goods, chiefly water) supplied to the external world will

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