

specified tillage techniques. However, to date the most successful PWS initiatives appear to have been in countries with relatively small numbers of farmers characterised by secure land tenure (Costa Rica, New York City, USA,). This mirrors the adoption of wildlife as a landuse in southern Africa where initially it was the large-scale commercial farmers who substantially changed their landuse management as a result of the incentives offered.

In many cases PWS initiatives are just starting. The similarities between CBNRM and PWS process and the underlying assumptions suggest that there are important lessons and experiences that need to be exchanged. The PWS community needs to look closely at the CBNRM experience of long-term financial transfers to small-scale farmers and the resultant changes in landuse. Conversely, the CBNRM community, especially in southern Africa should consider some of the ideas emerging from PWS (such as contingency) that may serve to strengthen their own long-term initiatives.

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PAYING FOR ENVIRONMENTAL SERVICES IN CHINA: LESSONS LEARNED FROM A PROMISING APPROACH

By Horst Weyerhauser

China's mountains house the headwaters of many of its greater and lesser rivers; they are also home to a majority of its chronically poor. Here the tension between watershed conservation and poverty alleviation is probably more acute than almost anywhere in the world.

This divide between upland conservation and development priorities was aggravated following China's shift from a centrally planned to a more market-oriented, decentralized economy in 1978. The costs and benefits of maintaining environmental services provided by upland forests –flood prevention, erosion control, and water quality in particular– had traditionally been borne by and accrued to a centralized state, but state withdrawal broke the direct link between producers and beneficiaries. With declining government support and without incentives for households, businesses, and local government to conserve, deforestation in the uplands became widespread.

The notion of paying and charging for specific environmental services emerged in this context. To cope with declining revenues and worsening deforestation, local officials in Qingcheng Mountain –a tourist attraction in Sichuan Province– designed a system where part of ticket proceeds were used to pay for forest protection. Forests quickly recovered, and the scheme inspired an official dialogue

on payments for environmental services from 1989 and continuing throughout the early and mid-1990s.

Severe flooding on the Yangtze and Song Rivers in 1998 accelerated the Chinese government's growing recognition of the benefits provided by upland forests, as well as of the difficulties in using regulatory approaches to control the behaviour of resource-dependent smallholder farmers. Government then developed public payment schemes to compensate farmers' investments in forest restoration and protection. China's revised Forest Law (1998) and Water Law (2002) formally recognized the importance of compensating environmental service provision.

Most payment schemes for environmental services in China have been publicly financed. Large-scale, central government initiatives are best represented by two forest conservation programmes: the Sloping Land Conversion or "Grain for Green" Programme (SLCP), which pays farmers to convert their marginal farmland to forest; and the Forest Ecosystem Compensation Programme (FECPP), which compensates farmers for reforestation and protecting forests. Provincial and local schemes cover a wide range of institutional innovations, such as electricity and water consumption fees dedicated to forest conservation, and direct payments to upstream farmers from downstream hydropower facilities. As limitations in public funding become increasingly apparent, private payment schemes will increase.

China's comparatively dense upland populations make watershed conservation difficult, but payments for environmental services are a particularly promising

approach. Realizing this promise will require adequate time and resource commitments, but also high-level willingness to experiment, facilitate open and honest dialogue about the results and improve upon them. As part of this learning process, China's State Forest Administration, the Regional Development Research Center and the World Agroforestry Centre (ICRAF) examined payment schemes for environmental services in Anhui, Guizhou, Sichuan and Yunnan Provinces, and identified several principles and practices that could improve their design and operation throughout China.

Design: Function, Financing, and Scale

- *Reasonable incentives are key to maintaining environmental services over the longer term.* Upland farmers will only change their land use practices over the medium to longer term if they expect to benefit from the change. The continued ineffectiveness of logging quota in China shows how command-and-control approaches can drive innovation in legal circumvention rather than long-term changes in land use.
- *Payment schemes require adequate funding to ensure adequate levels of environmental services.* Paying for forest and watershed protection requires sufficient long-term funding to cover the costs of planting high-quality trees and maintaining them, as well as the opportunity costs of different forms of forestry vis-à-vis other land uses. Where financing is inadequate or not linked to specific quality indicators, farmers often revert to agriculture or plant low-quality trees with poor economic and ecological returns.
- *Clear objectives and evaluation procedures can help allocate scarce financial resources.* China's large-scale,

national payment programmes in particular demonstrate how the lack of clear, measurable objectives and means to evaluate progress can lead to programme drift and unintended uses of funds. National and provincial programmes typically have been paying to restore forest cover on the assumption that forests will be beneficial, rather than to reward measurable environmental services. The primary criterion of programme performance has been forest cover; payments have hardly been linked with the provision of actual environmental services.

Operation: Governance and Institutions

- *Ensuring stakeholder participation from the beginning can improve acceptability and lower transaction costs.* Despite increased overall stakeholder participation, the still limited participation by both local governments and residents in the design of payment schemes has impaired their willingness to provide and willingness to pay. Greater inclusiveness can improve programme design, strengthen linkages between producers and beneficiaries, lower enforcement costs and improve results.
- *Transparency in revenue use and valuation methods is key to gaining public acceptance and maintaining the quality of environmental services.* For both public and public-private initiatives, transparency in deciding how payments are calculated and how they are to be used can bolster public support and improve the links between payments and environmental service provision. Standardized, rapid means of measuring and valuing environmental services in China should be developed.
- *Government agencies and local*

governments should continue to play a central, facilitating role. Government is currently the core actor in China's payment schemes for environmental services, and its role will become more important as more private payment schemes emerge. In lieu of a stronger, independent legal system, Government agencies and local governments play an irreplaceable role in facilitating fairer negotiations and effective contracts between producers and beneficiaries.

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MANAGING FORESTED WATERSHED FUNCTIONS AND SERVICES FOR THE BENEFITS OF THE POOR

By Daniel Murdiyarso and Ulrik Ilstedt

Watersheds need to be managed to provide environmental flows, defined as flows of water regime in the rivers maintaining the ecosystems and their services. This flow is influenced by land-use decisions made by stakeholders at various levels. When scientific information is lacking, or confusing, there is a pressure to impose public perceptions of the impacts of land-use on environmental flows. Often the