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Review: Payments for watershed services and the myth of simple solutions

It is a tall order to expect any single policy or market-based instrument to control floods, maintain or increase dry season flow, reduce sedimentation and landslides, provide a source of funding for conservation, and alleviate poverty. However, the notion that paying people to maintain forests will accomplish all of these things if we can just *get the science right* so that we can *get the prices right* remains implicit in many initiatives to establish payments for watershed services (PWS).

The mystery is why such myths persist, in spite of over 20 years of scientific research that states the obvious, at least to hydrologists, that trees are also consumers of water and that this is a complex topic that does not lend itself to any one simple solution. Perhaps such myths persist because they provide a basis for simple and standardized solutions, or “magic bullets”, which are the stuff of bureaucracy. They have also provided the basis for approaches to watershed management in which many interests have become invested, such as relocating people to make way for forestry plantations, and construction of check dams to capture water and soil for consumption in upstream areas.

Given that information can never be complete, and that rationality is “bounded,” myths are unavoidable and have always played a role in shaping responses to uncertainty that is inherent in any complex problem. Investigating and challenging outdated myths that are no longer appropriate is the stuff of science. When these myths become deeply rooted beliefs that also justify policy agendas and commitments of financial resources, science can become a precarious enterprise. Numerous studies and reports reinforce this message. But challenging and questioning myths has proven easier than developing evidence-based policies and effective payment arrangements.

There is little if any doubt that forests and land use practices play a significant role in the hydrological cycle and that market-based approaches are an important tool for achieving goals associated with conservation and poverty alleviation. The key question is not whether but how to best design PWS initiatives, given the biophysical characteristics of watersheds and transaction costs of overcoming institutional constraints. Given the uncertainties of land and water interactions, the changing climate, and the need to collect data over a long period of time and large spatial scales, it simply may not be feasible to provide the level of scientific validation needed to quantify the benefits to specific users, and directly link these to specific service providers. Such approaches may also place the poor at a greater disadvantage given that they often do not have land title, and have less negotiating power.

These kinds of difficulties have led to a current emphasis on pilot PWS initiatives at small scales, where it is considered more feasible to demonstrate relationships between land management practices and hydrological outcomes. However, a report based on recent DFID sponsored research, primarily in South Africa, India and Costa Rica, suggests this dilemma could also justify the opposite approach. Although it is even more elusive to link land use with water flows at regional and national scales, an argument can be made that there is a national benefit to insuring a positive hydrological outcome of land use, for which it is more equitable to share the responsibility for payment across a broader range of users, including taxpayers. This permits reliance on existing government infrastructure for collection of payments and provides numerous

other benefits including a bigger pool of resources to support scientific assessment and planning, greater flexibility to direct payments towards management practices that can have the greatest benefit for purposes of water production, and greater assurance that long term arrangements will be enforced. A national level approach may also be necessary for placing smaller scale initiatives into the context of a regional, national and/or basin-wide plan, and for supporting a landscape approach to conservation.

The DFID report also concludes that land use needs to be routinely considered as part of water planning, and that more attention should be given to quantifying “green water” – the amount of water pumped up and evapotranspired by vegetation, which is therefore unavailable for streamflow. This is essential in understanding the impacts of land use on the flow of water and is a major area of cutting edge research that will be the subject of a future bulletin.

References and further reading

UK DFID [From the Mountain to the Tap: how land use and water management can work for the rural poor](#) (pdf). UK Department for International Development, Forestry Research Programme.

This report provides an overview of recent DFID sponsored research conducted by the Center for Land Use and water Resources Research at the University of Newcastle upon Tyne, and the Free University of Amsterdam, with partners in several other countries.

Some previous studies and reports that address the issue of myths about forests and water:

Aylward, B. (2004) Land-use, Hydrological Function and Economic Valuation. IN Bonnell, M. & Bruijnzeel, L. A. (Eds.) Forests-Water-People in the Humid Tropics. Cambridge, Cambridge University Press.

Blaikie, P. M. & Muldavin, J. S. S. (2004) Upstream, Downstream, China, India: The Politics of Environment in the Himalayan Region. *Annals of the Association of American Geographers*, 94, 520-548.

Bonnell, M. & Bruijnzeel, L. A. (Eds.) Forests-Water-People in the Humid Tropics. Cambridge, Cambridge University Press.

Bruijnzeel, S. A. (1990) Hydrology of Moist Tropical Forests and Effects of Conversion: A State of the Knowledge Review. Humid Tropics Programme, UNESCO, Paris

Bruijnzeel, L. A. & Proctor, J. (1995) Hydrology and Biogeochemistry of Tropical Montane Cloud Forests: what do we really know? In: eds. Tropical Montane Cloud Forests. *Ecological Studies* 110, Springer Verlag, New York, pp. 38-78. IN Hamilton, L. S., Juvik, J. O. & Scatena, F. N. (Eds.) Tropical Montane Cloud Forests. New York, Springer Verlag.

Bruijnzeel, L. A. (2001) Hydrology of Tropical Montane Cloud Forests: A Reassessment. *Land Use and Water Resources Research*, 1, 1.1-1.18.

Bruijnzeel, L. A. (2004) Hydrological functions of tropical forests: not seeing the soil for the trees? *Agriculture Ecosystems and Environment*, 104, 185-228.

Calder, I. R. (1999) *The Blue Revolution: Land Use and Integrated Water Resources Management*, London, Earthscan.

Calder, I. R. (2000) Land Use Impacts on Water Resources. Background paper for the FAO E-Workshop on Land-Water Linkages in Rural Watersheds FAO, Rome

Chomitz, K. M. & Kumari, K. (1998) The Domestic Benefits of Tropical Forests: A Critical Review. Policy Research Working Paper 1601, The World Bank, Washington D.C.

Hamilton, L.S. with King, P.N. 1983. Tropical Forested Watersheds: Hydrologic and Soils Response to Major Uses or Conversions. Westview Press, Boulder, USA.

Hofer, T. (1997) Meghalaya, Not Himalaya. *Himal*, 52-56.

Ives J D and Messerli B., 1989. [The Himalayan Dilemma: Reconciling Development and Conservation](#). UNU Press

Kaimowitz, D. (2001) Useful Myths and Intractable Truths: The Politics of the Link between Forests and Water in Central America. IN Bonnell, M. & Bruijnzeel, L. A. (Eds.) *Forests-Water-People in the Humid Tropics*. Cambridge, Cambridge University Press.

Kiersch, B. and Tognetti, S.S. 2002. Land-water linkages in rural watersheds: Results from the FAO electronic workshop. [Land Use and Water Resources Research](#) (2) pp. 1.1-1.6

Rojas, M. & Aylward, B. (2003) What are we Learning from Experiences with Markets for Environmental Services in Costa Rica? A Review and Critique of the Literature. Working Paper International Institute for Environment and Development, London

Saberwal, V. K. (1997) Science and the desiccationist discourse of the twentieth century. *Environment and History*, 3, 309-43.

Saberwal, V. K. (1999) *Pastoral Politics: Shepherds, Bureaucrats, and Conservation in the Western Himalaya*, Delhi, Oxford University Press.

UN FAO (2002) [Land-Water Linkages in Rural Watersheds Electronic Workshop](#), 18 September - 27 October 2000. Land and Water Bulletin 9, UN Food and Agriculture Organization, Rome

UN FAO & CIFOR (2005) [Forests and floods: Drowning in fiction or thriving on facts?](#) RAP Publication 2005/03; Forest Perspectives 2 Food & Agriculture Organization of the United Nations and the Center for International Forestry Research, Bangkok

Feedback and Commentary

If you have a good rule-of-thumb, or other comments, please send them to comments@flowsonline.net for inclusion in the next bulletin. We also welcome input and references for the forthcoming bulletin on land use change and watershed services.

Announcements

UNECE Seminar on Environmental Services and Financing for the Protection and Sustainable Use of Ecosystems. (Geneva, 10-11 October 2005) UN Economic and Social Council, Economic Commission for Europe, Meeting of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. The seminar is a follow-up to the Seminar on the Role of Ecosystems as Water Suppliers (December 2004), in which governmental officials, experts from international organizations, non-governmental organizations and the private sector highlighted the role of water-related ecosystems (wetlands and forests) in water management and made recommendations for an effective implementation of the ecosystem approach. This Seminar will be organized around three major themes: valuing ecosystem services, legal and contractual aspects, and challenges for implementation. The Seminar is organized by the UNECE secretariat of the Water Convention and the Swiss Agency for the Environment, Forests and Landscape, in close cooperation with the World Conservation Union (IUCN) and the secretariat of the 1971 Ramsar Convention on Wetlands. Cooperation has also been sought with

the UNECE Timber Committee, the Food and Agriculture Organization of the United Nations (FAO) and the Ministerial Conference on the Protection of Forests in Europe (MCPFE). Further information on the seminar is available at http://www.unece.org/env/water/meetings/payment_ecosystems/seminar.htm.

About the Flows Bulletin

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