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Note: The purpose of Flows is to gather and disseminate lessons being learned from PWS initiatives. It has also been a process of learning and experimenting with new forms of electronic communication. Your feedback is a critical part of this process. Please [click here](#) to take a brief survey.

Review: Creating 21st century institutions for watershed markets

Watershed services come in bundles from a single dynamic landscape that, managed properly, stores nutrients and carbon in the soil, provides wildlife habitat, and allows for the infiltration and storage of water that would otherwise flow across the surface, eroding the soil, and transporting pollutants to water bodies. Despite this they tend to be managed one at a time, in separate programs, that have diverse sources of funding. For example, there are typically separate payment programs or regulatory requirements to reduce non-point sources of pollution, to promote conservation practices in agriculture, to protect wetlands and wildlife habitat, and for carbon sequestration. This fragmentation is further compounded by the separation of watershed areas into separate political jurisdictions whose boundaries do not coincide with those of the watershed.

This raises the question of what kind of institutional and regulatory structures are necessary to support watershed service markets, and that are also feasible to develop. This was the theme of one of the sessions at the conference of the Katoomba group held in Portland, Oregon June 7-9 2006. The challenge, according to Al Appleton (who negotiated the New York City Watershed Agreement on behalf of the city's Department of Environmental Protection), is "to move from 20th century vertically oriented supply side institutions to 21st century horizontally integrated demand side institutions."

Among the obstacles to developing new institutions is that existing ones are typically reluctant to cede any of their authority to new entities – whose formation is necessary for comprehensive planning and management across upper watershed landscapes. However, there are some useful lessons that can be learned from existing cases.

In the Cuyahoga river basin in the United States for example, separate trading systems for stream, wetland and habitat mitigation banks, as well as for water quality and carbon are being pursued. Mark Kieser, Acting Chair of the Environmental Trading Network and Senior Scientist with the consulting firm Kieser and Associates, presented a conservation development strategy for this basin that was designed to ease the pressure on land with high conservation value by reducing pollutant loads and storm water volume, increasing green space, public trails, groundwater recharge and base flow and restoring habitat. The strategy resulted in annual savings of \$US 1.6 to 5.3 million (compared with the cost of achieving the same result through separate programs) over an area of 1200 acres.

The next step will be to quantify the multiple ecosystem services so that credits can be identified by those who provide them. A key enabling factor for the Cuyahoga strategy is the existence of Conservancy Districts. These are watershed scale entities that have the authority to tax and control land use. The districts were established following a large flood in 1913 that exceeded the response capacity of local governments, and led them to support the creation of watershed entities entirely funded through local tax initiatives.

A unique feature of these districts is that they are overseen by a Circuit Court that consists of judges from each of the existing local jurisdictions. The judges in each district appoint a three-member board of directors who are therefore downwardly accountable to these local jurisdictions. According to Kieser, the Conservancy District model could easily be transformed into self-financing Ecosystem Service Districts - if they are given a mandate to facilitate payments for multiple services, and to direct public investment into water protection. Al Appleton suggests that water utilities are also an obvious candidate for the role of managing urban and rural exchanges.

Another institution that has roots in the early 20th century, and that was originally formed in response to a disaster, is the US Conservation Reserve Program. This program is a successor to the Soil Conservation Service which was set up to provide technical assistance to farmers following the Dust Bowl of the 1930s. The agency was renamed when its mission was expanded "to produce solutions instead of problems" by also providing financial support to farmers to implement a broader range of conservation measures. Given the enormous amount of conservation funding provided to OECD farmers, compared to other sources of conservation funding, it is clear that agricultural policies merit close attention. Unlike agricultural subsidies, payments that are contingent on management practices can leverage large returns in the form of ecosystem services – and not only in developed countries.

In the absence of disasters and large scale trends that create momentum for change, there is always the threat of regulation. In the New York City watershed, this was sufficient to obtain the cooperation of farmers who went on to exceed water quality objectives of their own accord (for details, see [Flows #7](#)).

Given the difficulties and complexity of developing new institutions, the key is to find a good starting point that can support a unified strategy, aimed at creating sustainable rural landscapes. According to Appleton, even a modest initiative can become a "righteous cycle" in which the flow of ecosystem services produces economic and social benefits that can be reinvested back into the environment, leading to further economic and social benefits. Scaling up might then occur through a process of co-evolution between social and environmental systems (Norgaard, 1994). This implies a process of finding and selecting environmental and cultural features that are mutually supportive. In other words, by choosing land use practices, policies, economic incentives and other institutional arrangements that support the production of valued ecosystem services. Equally important is to acquire the knowledge necessary to guide these choices. For less developed countries, the coevolutionary framework provides an alternative to importing inappropriate blueprints from developed countries, and having to learn the same lessons all over again, the hard way.

Note: additional comments from Al Appleton appear in the next section, below the references.

References and further information

Bromley D.W. 2000 [Can Agriculture Become an Environmental Asset?](#) World Economics 1:3

[Environmental Trading Network](#)

Kieser M. White paper on [Ecosystem Multiple Markets](#)

Norgaard R.B. Development Betrayed: The end of progress and a coevolutionary revisioning of the future. Routledge, London

The Katoomba Group. Making the Priceless Valuable: Jumpstarting Environmental Markets. [Presentations](#) made at Katoomba group conference held in Portland Oregon June 7-9, 2006:

The Katoomba Group Ecosystem Marketplace's [Daily Coverage of the Katoomba Group conference](#) held in Portland Oregon, June 7-9 2006

USDA Farm Bill 2007 [Conservation and the Environment Theme Paper](#), based on a forum that explores policy alternatives for addressing conservation and environmental issues on agricultural lands in the upcoming reauthorization of the US Farm Bill

For more information about Conservancy Districts see:
<http://www.miamiconservancy.org/about/history.asp>

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 forthcoming bulletins.

Additional remarks from AI Appleton:

Across the board in the infrastructure business, the world needs to move from 20th century vertically oriented supply side institutions to 21st century horizontally integrated, demand side oriented institutions. This is the same problem ecosystem services faces in the real (if sometimes tendentiously formalistic discussions of) issue of bundled versus unbundled services and what is the best approach to creating markets for them.

Watershed services come in bundles but the ecosystem that provides them is a single dynamic landscape, with an interacting pattern of human uses and ecosystem features. At the same time, as you point out, there are various payment streams that flow from the interest of specific actors in specific elements of those ecosystem services.

The question then becomes how do these payments get integrated into a structure that preserves the ecosystem in an efficient and unitary way. Keep in mind that the essence of agriculture and similar exploitations of rural landscapes by urban interests is, and has been since the time of Sumer, to simplify them ecologically, so that instead of maximizing overall productivity we maximize their productivity with respect to one desired output (i.e. soybeans, sunflowers, cattle). Many of these altered landscapes have new ecosystem values of their own that emerge over time, but the essence of human use of rural landscapes has always been to alter them in the direction of simplification.

Now, if fragmented funding streams create that pattern for ecosystem services then landscapes being managed for ecosystem services become just the latest example of the age old paradigm of urban rural relationships. Moreover, the founding impulse of ecosystem services, use of private capital to protect the ecosystem, becomes distorted once again into a focus on what urban buyers need, not what the ecosystem needs.

I submit that experience shows that rural landscapes need to be managed from a unitary point of view, that we need new institutions that can act as consolidated buyer for ecosystem service users and that our goal must be a payment system that creates enough value to preserve or restore a sustainable rural landscape, from both the natural and human perspective. Otherwise, all ecosystem service payments will do is buy time and save things on the margin because it will not create sufficient new wealth to alter the balance of opportunity costs for rural communities, which are currently weighed in favor of industrialization of food and fiber production and its concomitant, steadily increasing environmental pollution and a steady loss of the environmental vitality of rural landscapes and communities.

Thus I had three messages at Portland. First, create unified ecosystem service strategies for rural areas. Second, these strategies have to be a winner for all three sides, the urban payers, the rural populations and the environment, and they will achieve that goal only if they create sustainable rural landscapes, as distinguished by the development of righteous cycles of environmental and economic investment. Finally, to do these things, society will need new

institutions that can effectively manage this urban rural exchange and water utilities are one obvious candidate for that role.

New resources

Arifin B. [Transaction Cost Analysis of Upstream- Downstream Relations in Watershed Services: Lessons from Community-Based Forestry Management in Sumatra, Indonesia](#). Presented at the Conference of the International Association of Agricultural Economists (IAAE)

Bruijnzeel, L.A. "Sampurno" Presentations given at the World Bank and Conservation International, October 16-17, 2006:

To plant or not to plant? Hydrological benefits of tropical forestation programs under scrutiny. [Will be available online (shortly) at:
<http://info.worldbank.org/etools/BSPAN/index.asp>]

Hydrology of tropical montane cloud forests and effects of conversion: New research results from Costa Rica. [Will be available online (shortly) at:
<http://www.biodiversityscience.org/xp/CABS/home/>]

Conservation Finance Alliance: [Focus on Conservation Finance](#) (newsletter)

ICRAF [The difference a tree can make](#). Synthesis of past and current ICRAF research pertaining to tree-water-soil interactions, launched at World Water Week.

[Synthesis 1 Tree Water Use](#) The right tree for a dry place
Authors: Rachel Rumley and Chin Ong

[Synthesis 2 Muddy Rivers](#) Muddy rivers — lack of trees?
Authors: Meine van Noordwijk, Bruno Verbist and Kurniatun Hairiah

[Synthesis 3 Science - Policy Nexus](#) Rooting policy in science
Authors: Brent Swallow and Rachel Rumley

[More Trees with Less Water](#) More trees with less water
Authors: Rachel Rumley, Catherine Muthuri and Chin Ong

The Katoomba Group's Ecosystem Marketplace. 2006. EM Market Insights: Communities and Developing Countries. [A tale of two continents: ecosystem services in Latin America and East and Southern Africa](#)

Nambiar, S. 2006. [Responsibility of scientists for balanced communication: Forests in the landscape for wood production and environmental care](#).

[Nature Valuation and Financing Network](#)'s aim is to stimulate the development and exchange of practical tools for proper valuation of the goods and services provided by ecosystems so that decisions concerning economic development are made with the full understanding of all the costs and benefits involved

RUPES [Institutional Reforms in Providing Rewards for Environmental Services: Lessons from Three RUPES Sites in Sumatra, Indonesia](#), presented at the Tropentag Conference (11-13 October 2005)

WWF [PES InfoExchange](#) newsletter number 14

Announcements

[Katoomba XI: Catalyzing Payments for Ecosystem Services in Africa](#)

A Meeting of the East and Southern Africa Katoomba Group

November 8-10, 2006 | Kirstenbosch Botanical Gardens | Cape Town, South Africa

About the Flows Bulletin

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