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A Market-Based Approach

In the early 1900s, New York City began paying for land management in the Catskills watershed to ensure safe drinking water for the city, avoiding the cost of building an expensive water treatment plant.

New York City provides just one example of a growing number of programs — called payment ecosystem services (PES) — in which users who benefit from clean water, habitat conservation, flood protection and other services from ecosystems pay for land management practices to provide these benefits.

No more than a hopeful policy a few decades ago, PES has emerged as a global trend, with hundreds of programs worldwide. This market-based policy approach holds the potential to make trees worth more standing than cut down. But, to date, comprehensive and reliable data have proven difficult to find, obscuring the true status of PES - which PES strategies have grown to scale, which have not, and why.

In a new paper published in Nature Sustainability, researchers find a large and growing global marketplace for ecosystem services. Today, over 550 PES programs are active worldwide, in both developed and developing countries, with more than $36 billion in annual transactions. The study, the first peer-reviewed, global assessment of the trends and current status of PES mechanisms for water, biodiversity and forest/land use carbon, was led by James Salzman, the Donald Bren Distinguished Professor of Law, who has joint appointments at the Bren School of Environmental Science & Management and at UCLA School of Law, and researchers at Ecosystem Marketplace, an initiative of the non-profit organization Forest Trends.

Watershed PES Sees Fastest Global Growth

“PES payments for watershed services is the largest and most rapidly growing, with $24.7 billion in 62 countries in 2015, as compared to $6.7 billion in 2009,” said Salzman. “The rapid growth of watershed PES can be explained in part by the fact that beneficiaries of flood protection and clean water often see the local connection between land management in watersheds and these ecosystem services.”

In addition, Salzman continued, most countries have water utilities or government tax programs in place to collect funds to pay for the programs.

China’s “eco-compensation scheme” is the world’s largest PES program, he noted. “Responding to a series of major floods and droughts in the late 1990s, China countered the threat from deforestation by distributing over $100 billion from 2001-2010 for tree planting, logging bans and conversion of cropland to forests.”

According to Salzman, PES watershed schemes have rapidly emerged in Latin America as well, where at least 57 funds have been created in the past decade. The Latin American Water Funds Partnership, led by The Nature Conservancy, accounts for 16 operating funds. And the Brazilian National Water Agency runs 19 programs that protect drinking water for people in São Paulo, Rio de Janiero and other cities.

Strong Interest in Forest Carbon PES, but Country Climate Action Will Power Growth

“The forest carbon market has received the most attention of any PES sector,” Salzman said. “Our study finds market-based payments for forestry and land use practices that sequester carbon have topped $2.8 billion.” The sector, he added, has been volatile and the potential for growth will depend largely on how countries implement the Paris Agreement on climate change.

“The European Union’s Emissions Trading Scheme, for example, has not directed investment flows to forest conservation,” Salzman explained. “It’s also unclear whether national or subnational programs will accept [carbon] credits from developing countries reducing emissions from deforestation and forest degradation.”

Biodiversity PES Faces Challenges to Scale

The biodiversity PES sector is the least developed and most challenging, with only 36 programs worldwide.

“Unlike watershed PES where beneficiaries of clean water and flood protection are straightforward and local, the beneficiaries of biodiversity are generally diffuse and the specific benefits often indirect or nonmaterial — such as the enjoyment of knowing California condors fly once again in the wild,” said Salzman. “As a result, biodiversity PES programs exist only in a small number of countries and the most successful initiatives rely on regulatory drivers.”

Yet in many parts of the world where conservation is most under threat, alternative to PES may be infeasible. In countries without governance capacity, regulation or credible enforcement, PEA mechanisms operating at small scale may represent the most promising conservation strategy.

Regulations and Government Subsidies Advance PES

The study by Salzman and Ecosystem Marketplace finds the largest PES programs all are based on transactions mandated by compliance with regulation or government-funded subsidies.

“PES transactions driven by regulations, such as requiring offsets for development of wetlands, have grown to billions of dollars,” Salzman said. “Regulation allows governments to create demand, organize buyers and prevent free-riding on ecosystems that are public goods. But regulations for PES are also restricted to a small number of developed countries with governance capacity to ensure compliance. This is true across PES sectors, from water quality trading and wetlands mitigation banking to compliance biodiversity and carbon trading.”

According to Salzman, the second mechanism that has scaled up is government subsidy, where landowners are paid from public funds. This is most evident in the programs developed in China, but also programs in the U.S. and Europe that pay farmers to fallow lands that can serve as wildlife habitat or prevent erosion.

Looking to the Future

“PES is still a young policy approach with great potential,” noted Salzman. “As our research has shown, though, performance has varied greatly depending on the particular sector. Looking forward, we expect PES for water to continue its rapid growth around the globe.”

About UC Santa Barbara

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