

Payments for ecosystem services? Here's the guidebook

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The protection of migratory wildlife, such as wildebeest and zebra, in Tarangire National Park, Tanzania is supported by an annual payment by tour operators to a community living outside of the park in exchange for their efforts to conserve grazing areas for wildlife and to monitor illegal poaching. Credit: Jane Carter Ingram/WCS

A team of investors, development organizations, conservationists,

economists, and ecologists have published in the journal *Science* six natural science principles to ensure success of Payments for Ecosystem Services, mechanisms that have helped preserve carbon stocks stored in Madagascar's rainforests, maintain wildlife populations important for tourism in Tanzania, and protect watersheds in France by working with local farmers.

This is the first time principles have been agreed upon for applying science to PES projects.

Agreement from a diverse field of experts on these [scientific principles](#) represents an important milestone in the use of Payments for Ecosystem Services and will help ensure that these very important tools are effective at conserving nature and providing benefits to society.

Ecosystem services refer to the many different benefits that nature provides to people and society. Payment for Ecosystem Services and similar transactions stimulate investments in nature's benefits and are the vanguard for meeting society's social and environmental objectives such as conserving wildlife, securing clean water, mitigating climate change and maintaining natural infrastructure for disaster risk reduction. Such investments and markets focused on carbon, water and biodiversity, for example, are increasing globally and can be extremely useful for creating incentives for conservation.

However, the authors say there is a risk that many of these financial mechanisms are being implemented without a sound, scientific understanding of the environmental components upon which transactions are based. A strong scientific foundation must underpin these mechanisms if they are to deliver returns financially and ecologically. If we don't understand, measure, or monitor what people are paying for, then these approaches will not work.

The principles were designed to be scientifically robust yet practical and general enough that they can be applied to transactions involving water, carbon, wildlife, and/or other benefits provided by nature such as disaster risk reduction, pollination and/or disease regulation.



WCS has been working with partners to conduct the scientific assessments necessary to implement Payments for Ecosystem Services that could help conserve the forests in south-western Rwanda, which provide critical benefits to communities, businesses and the government. Credit: Jane carter Ingram/WCS

The six principles are as follows:

- Understand the Dynamics of a System- Interventions must

consider the natural and anthropogenic drivers that influence the dynamics of an ecosystem and the stocks and flows of the benefits it generates.

- Document Baseline Conditions-Initial conditions must be documented to assess if and how transactions have helped secure the desired ecological outcome(s).
- Monitor Outcomes-Practical yet scientifically sound monitoring is necessary to track progress and status of desired outcomes and [ecosystem dynamics](#) relative to baseline conditions.
- Metrics - The use of robust, efficient, and versatile methods for procuring and analyzing data is critical for supporting sound decision making related to investments and ecosystem management.
- Understanding Connections Among Multiple Ecosystem Services - It is important to recognize tradeoffs and synergies among multiple services or benefits provided by an ecosystem.
- Ecological Sustainability -If a PES or similar financial mechanisms are to be sustainable in the long-term, it is critical to consider how an ecosystem and the benefits it provides may change throughout time.

Said lead author Shahid Naeem, Director, Earth Institute Center for Environmental Sustainability and Professor of Ecology at Columbia University: "Whether it is the preservation of the diversity of life on Earth, improving food and water security, or wisely managing forests so that they can continue to scrub excess carbon dioxide from our atmosphere, Payment for Ecosystem Service projects are among the best options for meeting our environmental objectives. There are probably thousands of these projects worldwide, but there hasn't been enough time to get a consensus on how best to achieve their objectives. Getting the science right, by which we mean adhering to a few basic guidelines, can go a long way in insuring that these projects work and work well."

Co-author Jane Carter Ingram, Director of Ecosystem Services for WCS, said: "Pay-for-performance approaches, such as Payments for Ecosystem Services and other investments in natural capital, can generate significant financial incentives for maintaining critical ecosystems. However, it is important that we get these mechanisms right so that buyers get what they pay for and so that nature is protected in the process. For this reason, fundamental scientific understandings of the way the natural world functions must be integrated into the design and implementation of any transaction involving ecological products or services, if social, economic and biological values of nature are to be maintained in the long-term."

The paper is the result of a two-and-a-half year initiative comprised of leading researchers, practitioners, policy makers and investors working on these issues to collaboratively identify the basic scientific principles that should be considered when structuring and implementing payments for nature's services. Gaining consensus among a diverse group of experts on the scientific principles that are most important for guiding Payment for Ecosystem Services initiatives is a major accomplishment. The authors say if these basic principles are addressed by project developers and investors, then transactions involving ecological assets will be less risky and better value for money.

Said Naeem "If society is putting its trust in Payment for Ecosystem Service programs for meeting just about every environmental objective one can think of, at a minimum, insuring that every program meets a minimum of a few basic science guidelines will provide much greater certainty that they will succeed."

More information: Get the science right when paying for nature's services, www.sciencemag.org/lookup/doi/.../1126/science.aaa1403

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