

## **Upland agriculture as a provider of ecosystem services?<sup>1</sup> (Session 9)**

**(CPWF International Forum, morning session, Wednesday November 15)**

The development of modern agriculture has had a profoundly destructive effect on the environment, significantly reducing the capacity of ecosystems to provide the supporting, provisioning, regulating and cultural functions that sustain human life. Recuperation and/or preservation of these ecosystems functions motivate efforts to curb agricultural expansion and convert agricultural land back to its natural state, usually forest, wetland or páramo.

There is a growing body of evidence, however, that suggests that the impacts of agriculture on ecosystem services may not be uniformly negative (refs). It may not be agriculture per se, but rather specific land management practices within agriculture, that are harmful. Many of the practices in so-called sustainable agriculture—ie soil and water conservation, integrated pest management or agroforestry—can, especially if applied over large areas, have significant effects on biodiversity, carbon stocks, and catchment hydrology. Some agricultural systems, such as rice paddies, may also perform some of the services provided by natural systems such as wetlands.

The implications of agriculture as a provider of ecosystems services could be important, especially in developing countries facing difficult tradeoffs between food production, poverty alleviation and environmental conservation. Changes in land management, as opposed to land use, may also be easier and less costly to achieve.

The objective of this session is to assess the potential of agriculture as a provider of ecosystem services, especially but not exclusively those related to water, and to identify priorities for research and development (R&D).

Specific issues for discussion will include:

***1) What services can agriculture provide and will they be sufficient to meet the demand?***

Agriculture may not provide the same level and quality of some services as other land uses. Further, for those services that agriculture can effect, eg erosion control, evidence from some parts of the world suggests that agriculture is not the main contributor to the problem and therefore may have limited impact on the solution. Are there priority regions or agricultural systems that should be the focus of efforts to increase provision of ES from agriculture? How can we use advances in GIS and modeling to identify these areas?

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<sup>1</sup> Organized by Nancy Johnson, Theme 2, CPWF. Former title: Paying for nature.

**2) *What mechanisms are most appropriate to facilitate service provision?***

PES schemes can be based on a range of economic incentives, i.e., markets, subsidies, certification and price premiums. Evidence from past studies on adoption and diffusion of eg soil and water conservation practices, however, show that non-economic characteristics such as education or social values also play a significant role in the decision to adopt. It is likely that a combination of market incentives, policies and education will likely be necessary.

**3) *Which farmers are likely to benefit and what groups might be harmed?***

The biophysical characteristics of the farms and the watershed, the individual and household characteristics of farmers, and nature of the social and institutional environment in which they are located will all affect the willingness and ability of farmers to become environmental service providers. The possibility of capturing a new income stream from environmental service provision may change the relative returns to resources such as land, labor, and capital, which will have implications for those who own or otherwise access those resources.

Possible Papers

- CONDESAN review paper on PES in LAC, which makes the case for environmental services from agriculture
- Lessons from developed country experience on the topic
- Experiences with capturing environmental benefits in product prices (ie organics, fair trade, etc)
- Lessons from past adoption (or lack of adoption) of soil and water conservation practices
- Case studies