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CONCEPTUAL AND THEORETICAL ASPECTS OF 'PAYMENT FOR ECOSYSTEM SERVICES' IN THE TROPICAL SAVANNAS OF NORTHERN AUSTRALIA

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ABSTRACT

Paying landholders to produce ecosystem services—including water quality improvements, nature conservation and restoration, landscape management and carbon sequestration—is not a new concept. A generic term for such transactions is 'payments for ecosystem services' (PES), but they are also referred to as stewardship payments (Australia), green payments (USA), or agri-environmental schemes (Europe). PES describe voluntary transactions whereby well-defined ecosystem services are being 'bought' by at least one buyer (such as business, government, non-government organizations) from at least one provider.

PES schemes typically operate where ecosystem services are scarce and are, therefore, valuable. The need for relative scarcity poses a challenge for the application of PES in the tropical savannas, where natural capital is abundant; however, in the abundance also lies a market opportunity in that buyers aiming to protect existing services consider associated option values and/or anticipate emerging threats and future rises in opportunity costs. If potential buyers delay purchasing services until after changes have occurred, stocks of natural capital will be low and ecosystem services scarce and, therefore, expensive, and services may already have been (irreversibly) lost.

This paper explores the conceptual challenges that PES pose in a resource rich environment and explores the feasibility of the concept beyond agriculture-related activities.

Key words: p*ayments for ecosystem services, tropical savannas, market-based instruments*

INTRODUCTION

Paying landholders for producing ecosystem goods and services other than agricultural commodities is not a new concept. The generic term for such transactions is payments for ecosystem services (PES). However, different countries have adopted different policy labels, including stewardship payments (Australia), green payments (USA), or agri-environmental schemes (Europe).

Wunder (2005) defines PES as a voluntary transaction where a well-defined ecosystem service is being 'bought' by at least one buyer from at least one provider if, and only if, the provider indeed provides the ecosystem service. The five underlying principles include:

1. PES are based on a voluntary, negotiated contract between suppliers of ecosystem services (landholders) and a buyer. Landholders are not compelled to engage in contractual arrangements. Rather, they have a choice to provide the ecosystem service or not to provide it. In Victoria, many landholders, though not all, would be attracted to PES (Cocklin et al., 2003).

2. The ecosystem service that is being exchanged in the transaction must be well-defined. If it is not directly measurable—as is the case with most environmental outcomes—surrogate measures are

required that are directly linked to the provision of the service. For example, biodiversity may not be directly measurable but scrub diversity and density is.

3. To have a market, there needs to be at least one buyer. The buyer can be a government, acting on behalf of a community, or a private entity or non-government organisation. There are often brokers or intermediaries involved in functioning ecosystem services markets.

4. To have a market there also needs to be at least one supplier/provider. In most cases, there will be many providers.

5. To ensure the effectiveness of the scheme, payments are made conditional on the supplier meeting the service delivery specifications.

The notion of PES recognises that the delivery of ecosystem services tends to generate opportunity costs for resource managers where providing improved environmental outcomes conflicts with production goals. Payments for ecosystem services typically recognise conservation, regeneration, recycling and restoration activities by landholders, which go beyond their statutory and/or moral duty of care (Worrell et al., 2000).

Ecosystems perform functions and processes, which ensure natural cycles (eg water, carbon, oxygen, and nitrogen), processes and energy flows continue to provide an environment that supports life, including human life. Ecosystem services are "the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfil human life" (Daly, 1997). The categories of services encompass (De Groot et al., 2002):

- inputs to production
- regeneration of ecosystems
- stabilisation of soils, climates, weather
- protect people from the sun's harmful ultraviolet rays
- assimilation of wastes
- amenity
- options for the future

The ability of ecosystems to provide ecosystem services—but also goods such as water, food, fibre and timber—can be conceptualised as natural capital. Natural capital thus encapsulates the life-supporting capacity of ecosystems, and ecosystem services constitute the 'steady flow of interest' which humanity derives from natural capital (Ehrlich and Ehrlich, 2004).

ILLUSTRATIONS

There are four areas in particular where PES have been prevalent: in the areas of water quality protection, biodiversity conservation, landscape protection/countryside management and carbon sequestration. The following examples illustrate various schemes where landholders derive income from providing ecosystem services.

Water Quality

The New York City Council has been paying farmers in their drinking water supply catchment since 1997 to ensure potable water quality for the city's population, thus eliminating the requirement for a multi-billion-dollar water treatment facility to be built. New York entered into a partnership with landholders in its catchment area (the New York City Watershed Agreement) and administered a series of voluntary programs which promote and support environmentally-protective farming practices. These programs include acquisition of land and easements, implementation of new regulations affecting activities in the

watershed, and more than two dozen watershed protection and partnership programs. (http://www.nysefc.org/home/index.asp?page=19)

Landowners in Ecuador and Colombia are being paid under the 'Making Nature Count' program to protect cloud forest and high-altitude alpine grasslands to secure their functioning in producing plentiful amounts of good quality water for users downstream. (http://www.cifor.cgiar.org/pes/_ref/projects/ecuador.htm)

Nature conservation and restoration

In the Little Broadwater Swamp of the Clarence River in New South Wales approximately 100 hectares of former fish habitat have had their natural tidal flow reinstated by opening floodgates. Affected landholders receive stewardship payments to cease grazing and to garner support for the reintroduction of tidal flow onto the wetland. The programme is administered by Wetland Care Australia. (http://www.clarence.nsw.gov.au/content/uploads/Little_Broadwater_brochure.pdf

Farmers in Jamestown, Rhode Island (USA), are being paid by local residents to delay haying their fields until after birds have completed nesting. The program is specifically directed at protecting the habitat for bobolinks, a grassland-nesting bird. (http://www.sciencedaily.com/releases/2007/06/070627113826.htm)

Landholders across the Wimmera and south-west Victoria are paid to protect regenerate the natural habitat of the red tailed black cockatoo, which is threatened with extinction because of a loss of woodlands. It is estimated that only 1,000 of the cockatoos are left.

Countryside management

Farmers in Switzerland receive direct payments for maintaining the traditional features and mosaics of the agricultural landscape, which are valued by the Swiss population and international tourist, using traditional (ecological) production methods, such as high-country grazing during summer months. (http://www.blw.admin.ch/themen/00006/index.html?lang=de)

Countryside Stewardship is the UK government's main scheme for the wider countryside, aiming, through the payment of grants, to improve the natural beauty and diversity of the countryside, enhance, restore and re-create targeted landscapes, their wildlife habitats and historical features, and to improve opportunities for public access. (http://www.defra.gov.uk/erdp/schemes/css/default.htm#2)

Sequestering Carbon

The Landcare CarbonSMART project operates predominantly in NSW and provides a broker for the sequestration of carbon, whereby farmers and landholders can earn money by planting and maintaining vegetation for biodiversity over a 30-year period. Individuals and businesses can buy carbon credits from CarbonSMART. (http://www.carbonsmart.com.au/Default.aspx)

RELEVANCE OF THE CONCEPT TO THE TROPICAL SAVANNAS

The increasing scarcity of wilderness, natural habitats, biodiversity and other aspects of natural capital drives a surge in the worth of these goods. The incidence of PES schemes provides evidence of this. Programs started to emerge in the later 1980s in Europe, and have spread globally from there. In Australia, ecosystem payment schemes are most prevalent in Victoria, the state with arguably the highest scarcity of remaining original habitats and indigenous biodiversity.

The need for relative scarcity poses a challenge for the tropical savanna landscapes of Australia where natural capital is aplenty (Woinarski *et al.*, 2007). Wunder (2005: p.5) warns that not everybody who provides an ecosystem service can expect payment "since services that are neither highly valuable and/or not threatened are unlikely to find buyers."

However, in the abundance also lies a market chance in that buyers aiming to protect existing but threatened services may need to anticipate emerging threats and future rises in opportunity costs. If they delay purchasing services until after changes have occurred, stocks of natural capital will be low and ecosystem services scarce, and services may already have been (irreversibly) lost (Wunder 2005).

The Northern Gulf region in north Queensland is reviewing which natural assets may position the region strategically for PES opportunities, including those not linked to agricultural and pastoral land uses. Bio-security may be but one such niche and the conservation of endemic fish species (e.g. grunter and swordfish) is another. Additionally, places like the Northern Gulf might provide the opportunity for ecosystem service projects that respond to global environmental issues such as climate change.

Across the Australian rangelands, including the tropical savannas, a transition has been happening from production objectives to what Holmes (2002) calls 'post-productivist' landscapes. Payments for ecosystem services form part of the income mix that sustains such 'multifunctional' landscapes. The challenge for regions such as the Northern Gulf is to recognise the ecosystem services they provide and be proactive in harnessing associated market and income opportunities.

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