



Market instruments, ecosystem services, and property rights: Assumptions and conditions for sustained social and ecological benefits

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ABSTRACT

Market-based instruments (MBIs) are promoted as economically efficient, targeted solutions to otherwise intractable environmental policy problems with additional potential to improve the livelihood security of ecosystem service providers. This paper argues that the effectiveness of MBIs (and the likelihood therefore of sustained environmental and social outcomes) depends on a number of often unacknowledged assumptions about the distribution of benefits arising from ecosystem service provision, the rights and duties associated with resource access, and the fitness for purpose of various policy instruments. These assumptions are illustrated and discussed using The Benefit Flows and Property Rights Matrix. It is argued that the legitimacy of MBIs depends both on the demonstrability of distinct public benefit and of acceptance among the wider community that private resource users ought to be compensated in some way for the provision of that benefit. Effective provision of ecosystem services through a market-mechanism thereafter depends on a range of additional conditions including inter-changeability of supply, scalability, lack of corroboration, adequate information, financial capacity, clarity of property rights, clarity of resource access-related duties and institutional capacity. Meeting these conditions is not simply a matter of appropriate incentive design but of political decision-making, moral judgement and social learning. Failure to recognise these conditions potentially undermines the effectiveness not only of MBIs but of alternative policy measures taken contemporaneously with MBIs such as community-based natural resource management.

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Introduction

Market-based instruments (MBIs) are promoted as economically efficient and targeted solutions to otherwise intractable environmental policy problems (NMBIWG, 2005). Such instruments are diverse. They include payments for ecosystem service provision (PES), pollution taxes, cap-and-trade schemes, eco-certification and labelling, and certain capacity building measures. What they have in common is the use of market mechanisms such as trading schemes, auctions and price signals to influence peoples' behaviour in pursuit of specific policy objectives (Dargusch and Griffiths, 2008; Scott, 1998). The use of market mechanisms, it is argued, provides the least cost path to environmental outcomes by allowing flexibility for individuals in the allocation of resources and by providing continuing incentives for innovation (see Lockie, 2010). Increasingly, the use of MBIs is also seen as an opportunity to produce social and cultural co-benefits including improved livelihood security for ecosystem service providers (Engel et al., 2008; Muradian et al., 2010; Scherr et al., 2010).

Eco-certification and labelling schemes attempt to achieve this by providing a basis for price premiums and more stable supply chain relationships for certified producers. Direct payments for the provision of ecosystem services de-couple payments from commodity production and provide service providers with an additional and potentially more stable income stream. Well known PES schemes designed explicitly to secure social co-benefits include the Kyoto Protocol's Clean Development Mechanism (Gong et al., 2010), the United Nations' Reduced Emissions from Deforestation and Forest Degradation scheme (Börner et al., 2010; Hoang, forthcoming) and many agri-environmental programs run under the European Union's Common Agricultural Policy (Courtney, forthcoming).

This paper offers a critical examination of the often unacknowledged assumptions underlying use of market-based instruments to pursue environmental policy objectives. To do this, it outlines a conceptual framework relevant to all arenas of environmental policy impacting on non-state resource users – *The Benefit Flows and Property Rights Matrix*. This matrix is used to highlight: first, the nature of ecosystem processes and the subsequent distribution of public and private benefits that arise from ecosystem management; second, the duty of care to the environment and other resource users implicit in resource-access rights and the extent to which provision of required ecosystem services may be accommodated within, or

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exceed, this duty; and third, the range of policy options that might be considered relevant in light of the aforementioned assumptions about ecosystem service distribution and property rights and duties. Failure to match policy instruments, it will be argued, with resource user and public beliefs regarding distributions of benefits and rights/duties is likely to undermine the legitimacy of programs and result in policy failure. Policy failure is also likely to arise from lack of fitness for purpose; that is, an inability of policy instruments to meet their stated objectives irrespective of additional and perhaps unintended social or environmental benefits. The paper will go on therefore to highlight a range of conditions particularly relevant to the effective operation of PES programs that allocate payments through the application of market instruments such as auctions and tenders.

The promise of 'the market'

There are two basic arguments fundamental to the case for MBIs in environmental policy. The first is that environmental degradation is an outcome of market failure that ought ideally, therefore, be resolved through market means (Muradian et al., 2010). This is based on the proposition that a properly functioning market will always take into account the protection and regeneration of those natural resources on which it depends. The costs of conservation, therefore, are a cost of production that ought to be internalized and passed on to consumers. However, it is argued, imperfect information, inadequately defined property rights, and/or pricing of natural resource inputs below their full economic and environmental cost all create incentives to over-utilise (Bardsely et al., 2002; Scott, 1998). Of course, market reform is not always possible in the short to medium term and a case may still be made for public expenditure in order to encourage structural adjustment or to purchase distinctly public goods. The second argument in favour of MBIs suggests that, under such circumstances, market mechanisms offer the most efficient and effective means for the allocation of resources as they create incentives to individuals which encourage competition, creativity and innovation (Bardsely et al., 2002; Dargusch and Griffiths, 2008). Regulation, conversely, is dismissed as cumbersome, blunt and ineffective. Utilising economic expertise it is now possible, MBI proponents argue, to 'design and create markets' in parts 'of the economy where this was previously impossible' (NMBIWG, 2005: 5).

The idea that environmental degradation is an outcome of market failure makes intuitive sense. Yet it is not always the case. For producers, it is *economically* rational to consider the internalization only of those environmental costs that support production. Ecological values unrelated to production are more rationally ignored. Further, standard welfare economics suggests that environmental costs should be considered examples of market failure only if the future benefits of addressing them exceed current costs (Bromley,

2007). Calculation of these benefits relies on the application of discount rates since future values are generally estimated to be worth less than current values in real terms. Proponents of environmental reform argue for lower discount rates that make investment to reduce future costs more attractive and to reflect a more precautionary approach to uncertainty over future ecosystem changes (e.g. the UK's Stern Report). Critics counter that such uncertainty should, if anything, be cause to adopt even higher discount rates. Complicating this, the costs and benefits of both action and inaction frequently fall on different actors due to the often extensive spatial and temporal scales of ecosystem processes (Bromley, 2007).

Of course, even if we accept that market failure is not always the best explanation for resource degradation, various forms of MBI may still offer the most effective policy options to deal with it. MBIs generally are classified into three broad groups (see Whitten and Shelton, 2005; NMBIWG, 2005). First, market friction mechanisms such as eco-labelling or education are used to improve the efficiency of existing markets by removing obstacles to the recognition of ecosystem services. Second, price-based mechanisms such as auctions, tenders and taxes are used to set or modify prices in order to force markets to incorporate the cost of ecosystem services. Third, quantity-based mechanisms such as cap-and-trade and offset schemes are used to set targets to achieve or maintain environmental services. This three-fold classification fails, however, to distinguish between those price-based instruments which seek explicitly to encourage *existing* markets to internalize environmental costs and those that seek, alternatively, to use price-based instruments as a means to create *new* markets through which to allocate payments for the provision of ecosystem services. The three-fold classification subsequently confuses those policy objectives that price-based instruments are inherently best suited to. It is proposed here that a four-fold classification is more useful which separates the use of price-based MBIs as tools of market reform from the use of price-based MBIs to create new markets for ecosystem services (see Table 1).

Whether evaluating the causes of degradation or designing policy interventions to address it, the most glaring weakness of many arguments in favour of MBIs is their circularity and consequent blindness to alternatives. Since failure is conceptualised as the outcome of factors external to the market, markets are seen never as the problem and always as the solution (Muradian et al., 2010). This is a non-refutable and non-verifiable article of faith. It is not a basis for sound policy. Nor does it resolve what are fundamentally moral and political questions over the internalization of costs that do not directly support production (Van Hecken and Bastiaensen, 2010). Bromley (1997: 1383) thus argues that while market mechanisms may be used to pursue well-defined policy goals they cannot be used to decide what those goals should be; for example, how clean air and water should be or how much biodiversity should be conserved.

Table 1
Typology of market-based instruments.^a

Classification	Market intervention	Examples	Suited to:
Market friction	Improving efficiency of existing markets by removing obstacles to recognition of ecosystem services	Standards, certification, eco-labelling, ethical investment schemes, capacity building	Outcomes that can be improved through reduced transaction costs or increased information
Price-based I (market reform)	Setting or modifying prices to incorporate the cost of ecosystem services	Eco-taxes	Measurable point source activities such as carbon emissions, water extraction etc.
Price-based II (market design)	Utilising market-mechanisms to allocate payments for ecosystem services	Auctions, tenders	Diffuse source environmental outcomes such as biodiversity, salinity mitigation etc.
Quantity-based	Setting targets to achieve or maintain ecosystem services	Cap and trade mechanisms, tradable offsets	Measurable point source activities such as carbon emissions, water extraction etc.

^a Adapted from Dargusch and Griffiths (2008), Whitten and Shelton (2005), and NMBIWG (2005).

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