

Nature in the Market-World: Ecosystem services and inequality

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ABSTRACT Programmes to address global warming and promote green development, such as Payments for Ecosystem Services and Reduced Emissions from Deforestation and [forest] Degradation financed by carbon-offset trading, are framed by a world-as-market paradigm that subsumes social goals within a project of globalized eco-economic management. Because market-based strategies reinforce existing property claims and power relations, Kathleen McAfee argues that they are likely to worsen inequality without yielding net, global environmental benefits. A better approach would build upon positive synergies between climate mitigation, agriculture, and rural livelihoods.

KEYWORDS ecosystem services; carbon markets; green economy; development; climate; environment; World Bank

Introduction: the market panacea and its problems

Green economy transitions face daunting challenges: rising seas and losses in agricultural production due to global warming, the closing of land frontiers, the persistence of hunger, growing unemployment, and economic instability. These trends are intertwined with increasing inequality both within the majority of nations and between the advanced industrialized countries and much of the Global South.

International policies to address these problems are often framed by a market-centred paradigm (Le Blanc, 2011; OECD, 2011). In this world view, private initiatives, monetary pricing, and market exchange are inherently more efficient than collective action, public planning, and regulation, and all resources and services are potentially tradable commodities.

Advocates of market efficiency in environmental management aim to subsume ecology, theoretically and practically, within a globalized, liberal-capitalist economy. They attempt to quantify and privatize the functions and components of nature and devise programmes to expand this approach from Europe and the United States, where it began, to the Global South. They contend that the use of 'market instruments' can achieve optimal allocation worldwide of the benefits of nature and the burdens of pollution and resource depletion (Pearce *et al.*, 1989; Mol and Sonnenfeld, 2000).

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Market-based strategies to mitigate climate change and biodiversity loss conceptualize natural landscapes as sources of ecosystem services. They ascribe property rights to ecosystem functions, such as storage of carbon or sheltering of species by forests, so that the right to use such services can be bought and sold, even internationally. Through schemes for Payments for Ecosystem Services (PES) and Reduced Emissions from Deforestation and [forest] Degradation (REDD and REDD+), nature is given a means in the global marketplace to earn its right to exist.¹

The market panacea, however, overlooks the uneven social consequences of market-based policies and itself gives rise to new problems. With regard to global greening, these include:

- Market-based allocation of environmental assets, including ecosystem services and tangible resources, tends to redistribute those assets upward, giving those people and places with the greatest purchasing power in global markets the greatest ability to obtain environmental benefits and avoid harms.
- Market-based, global environmentalism relies on asocial, economic logic. It wrongly assumes that nature's values are quantifiable and commensurable from place to place. It cannot grasp the practical importance of the use-values and meanings of nature in different ecological and cultural settings, nor can it take account of the disparate sources and social contexts of greenhouse gas (GHG) emissions.
- Market logic offers a superficially persuasive rationale for 'outsourcing' environmental harms to those places and populations where conservation and pollution mitigation can apparently be achieved at the least cost to 'society'. This rationale depends on a false notion of humanity's interests as unitary.
- Trade in permits to pollute, particularly the offsetting of GHG emissions by purchases of carbon-sequestration services or payments for adoption of lower-emissions technologies, does not reduce total, climate-warming emissions. Instead, it creates a misleading impression of net environmental gains. Markets alone cannot

achieve this, much less reset economies onto low-carbon pathways.

- Expectations for market-based climate mitigation through global carbon trading detract attention from the urgent need to reduce greenhouse emissions at their sources through strong regulation and major public investments.
- Market-led strategies put greening on a collision course with agriculture. Investments in biodiversity and GHG offsets create competition for land, including in regions where hunger is severe.²
- The market paradigm overlooks potential, positive synergies between conservation and climate mitigation and food production, rural employment, and equity.

Markets in ecosystem services

The late twentieth century saw the apex of neo-liberalism, the policy doctrine that equates GDP growth with development, substitutes trade for aid, and supports private initiative and competition in place of public planning and action. In this context, policy advisors sought to cope with planetary resource limits, species extinctions, and global warming in ways amenable to conventional economic methods and compatible with economic growth, without directly confronting established, fossil fuel-based economic trajectories. To this end, they conceptualized nature as a subsystem of the economy and developed the concept of natural capital (Serageldin, 1995).

Environmental economists began putting price tags on nature's benefits to society, reasoning that this could help to persuade publics and politicians that conservation and climate-change mitigation were worth paying for (Costanza *et al.*, 1997). By the century's turn, market-oriented thinking about nature was being used to promote the actual commodification and marketing of environmental assets and functions.

The most ambitious of these schemes are the World Bank's carbon funds. They are meant to finance low-carbon industrialization and forest conservation in developing countries by means that include international trade in ecosystem

services, mainly sales of forest carbon-sequestration functions in exchange for GHG-emissions offsets (Stern, 2009; World Bank, 2010).³

Ecosystem services comprise the functions of living nature that are useful to humans: carbon sequestration by oceans, vegetation, peat lands, and soil; habitat for valued species of flora, fauna, and microorganisms; containment and filtering of rainwater by wetlands and woods, buffering of tides by marshes and mangroves; even the aesthetic or spiritual significance woodlands, mountains, or waters (MA, 2005). Like genetic resources in bioprospecting projects in the 1980s–1990s, today ecosystem services are the commodity at the centre of strategies for ‘selling nature to save it’ (McAfee, 1999).

Projects for PES, sponsored by governments, multilateral agencies, non-government organizations (NGOs), and private, for-profit enterprises in Latin America, Southeast Asia, and China, are being expanded into Africa and other regions (Tacconi *et al.*, 2011; McAfee, 2012). Some are funded by national governments or local sources; others are designed to sell GHG and biodiversity offsets in international markets.

By steering public and private investments towards the Global South, proponents assert, transnational trade in ecosystem services can: (a) allocate scarce conservation resources efficiently, avoiding the need for ‘command-and-control’ regulation; (b) reward private investors; (c) help finance a transition to green economies in lower-income countries; and (d) alleviate rural poverty there. Ecosystem services have thus become the latest in a long series of tropical-export miracle crops expected to foster development.

Trade in credits for carbon-sequestration ecosystem services in the form of carbon-dioxide equivalents (CO₂es) is the most widespread form of ecosystem-services commerce. Firms or industry associations purchase credits that reduce the cost of complying with legal limits on their own GHG emissions or for public-relations purposes. Carbon trading has created new profit opportunities for transnational banks, hedge funds, brokers, and business consultants. Like adjustable-rate mortgages and other risky assets, emissions allowances are often securitized.

Carbon trading is particularly controversial when enterprises invest in carbon credits produced in a distant location in order to offset the effects of their own, continued emissions of GHGs. Critics note that carbon-offset transactions do nothing in themselves to reduce total, global emissions of GHGs while creating the illusions that ‘something is being done’ about global warming (Lohmann, 2009; Dooley *et al.*, 2011).

Schemes for REDD are in their early stages.⁴ There is much debate about whether any or all REDD programmes can be or should be ‘market-based’ or financed by public revenues, international grants, or private donations. Notably, the World Bank endorses a market-based model of REDD that extrapolates from the market-oriented principles upon which most existing PES projects have ostensibly been designed.⁵

PES contradictions in practice

Projects billed as PES, or sometimes ‘compensation for ecosystem services’ (CES), have been in effect in countries of the Global South for more than a decade. They typically remunerate landholders for practices such as restricting the movements of livestock, abstaining from farming, and, most commonly, planting or preserving trees for CO₂ storage or watershed management. Ecosystem services providers may be individuals, communities, or states with ownership or access rights to the land where the services are produced.

The buyers of ecosystem services may be conservation organizations, biodiversity brokers, for-profit enterprises, or, especially in the case of hydrological services, state or municipal agencies. In the fastest-growing category of PES, carbon-sequestration services, governments, multilateral agencies, private firms, or individuals pay sellers to maintain or increase the carbon-storage functions of natural forests, new plantations, peat land, or farmland. This is the basic idea behind REDD/REDD+ as a climate-change mitigation strategy.

However, case studies of PES projects reveal a pattern of problems that occur repeatedly across different settings (Engel *et al.*, 2008; Wunder, 2008; Muradian *et al.*, 2010; McAfee, 2012). Even

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while many PES projects have benefited their participants, this pattern raises doubts about whether PES is making any net, positive contribution to environmental sustainability, much less to conservation and development simultaneously (Storm, 2009; Pattanayak *et al.*, 2010).

Known unknowns

Doubts first arise from scientific and technological issues:

- *Ecological complexity and scientific uncertainty* make it very difficult to determine how much carbon is stored or released or how much water is conserved or consumed, if any, as the result of activities paid for by PES. It is all but impossible to devise methods and formulae for applying such estimates over various time scales and across ecosystems, which are always unique.

Additional problems are related to the greatly various socio-economic and institutional contexts in which PES projects are situated:

- *Leakage* occurs when environmentally destructive activities, such as logging or unsustainable forms of farming, are shifted from lands targeted for conservation to other sites.
- *Non-additionality* results when payments are made for conservation practices that would have occurred even in the absence of PES.
- *Perverse incentives* arise when expectations of payments prompt landholders to threaten to engage in more deforestation than they intend to carry out or when states overestimate past deforestation rates to demonstrate conservation progress.
- *Rent-seeking* and other *moral hazards* are linked to the conflicting priorities of ecosystem-service buyers, sellers, and those in charge of certifying compliance with PES or REDD requirements. Even when outright corruption is not a factor, subtle conflicts of interest can lead to claims of success based on selected, favourable data or optimistic but unsupported assumptions.

Two other types of widely reported problems expose internal inconsistencies in the market-centred, conservation-and-development model.

Equity versus efficiency

Market-based criteria for PES efficiency commonly conflict with social goals such as poverty alleviation. Some advocates view increased equity for poor landholders as the primary purpose of PES or CES. They see ecosystem-services payments, whatever their source, mainly as a means to enable indigenous and other rural communities to support themselves more sustainably.

At the opposite end of the spectrum are those who insist that mixing social with conservation goals can only undermine the latter. Although World Bank publicity depicts PES and REDD as boons to development, its guidelines warn that excessive focus on poverty reduction is 'counterproductive' to the more fundamental PES objective of maximizing efficiency in conservation spending.⁶

This tension between social and economic-efficiency goals is inherent *a priori* in the market paradigm, as explained below, but it is not merely theoretical. Those who design, implement, and participate directly in PES schemes are often forced give up either equity or efficiency objectives in favour of the other (McAfee, 2012).

Non-economic motives

The market model of efficient, market-based greening depends on the conceptual separation of the social from the natural sphere of life so that the latter can be quantified, priced, and incorporated as a component of 'the economy'. However, the actions and motives of ecosystem services providers are far more complex, varied, and contingent on social context than the market model can account for.

Farmers and forest dwellers often do not behave like the economically rational, benefit-maximizing individual at the core of neoclassical economic theory. Those with ties to the land and to their neighbours rarely base their decisions solely on

expected pecuniary gains. They may be influenced by traditional cultural values, new appreciation of ecosystems gained from interactions with environmentalists, rules of common-property management, communal pressures to conserve (or not to), individual preferences that vary with household structures, and survival strategies or the availability of other income sources (McAfee, 2012). Some studies suggest that projects that provide new, monetary incentives can 'crowd out' collective norms that have contributed to relatively equitable and sustainable management (Kosoy *et al.*, 2007).

A burgeoning industry of experts works on fine-tuning PES project designs and monitoring methods. They mobilize data from ecological studies, satellite imagery, and, more rarely, social surveys, feeding the results into ever-more-sophisticated models based on opportunity costs and related econometric methods (McKinsey and Associates, 2009; OECD, 2010; Ebeling and Olander, 2011).⁷ These technocratic calculations are doomed to come up short because they cannot cope with the place-specific variety of ecosystems. Nor can they apprehend the dynamics over time of local eco-social systems and their articulations with wider national and regional economies.

Few ecosystem 'markets' are markets

Very few PES arrangements conform to the economic definition of 'market' (Wunder, 2008; Muradian *et al.*, 2010; Vatn, 2010). First, as explained above, once a buyer has obtained credit for the paid-for service in the form of a greener public image or a tradable carbon offset, the buyer may not care about the product, that is, whether the ecosystem service supposedly being bought is actually produced.

Second, most putative markets in ecosystem services are constructed and maintained by public regulatory action. Often, PES programmes are enabled by new legislations and restructuring of government water or forestry agencies (McAfee and Shapiro, 2010). While some PES projects are financed through 'voluntary' carbon markets that come closer to being actual markets, even these may require new laws or official procedures. In

the case of carbon funds that are, arguably, genuine markets, for-profit investors buy shares in the expectation that future, stricter GHG regulations will make those shares more valuable. However, global carbon trading has stagnated since 2009, and advocates of this model have scaled back their expectations.

Third, nearly all PES schemes in Latin America, Asia, and Africa are financed by some combination of grants from multilateral agencies, host-government subsidies, or donations from conservation NGOs. There is vigorous debate among PES proponents about whether this situation is problematic or proper. While pro-market advocates would minimize the role of states, others contend that governments, individually or collectively, have a responsibility to compensate those whose environmental stewardship benefits the nation, and humanity as a whole (Rosa *et al.*, 2003). Critics and advocates of market-based REDD are embroiled in similar controversy.⁸

Contradictions in market-world theory

Ecosystem-services trading is intended to achieve environmental gains at the least possible economic cost. The use of putative market instruments is meant to preclude the political biases and inefficiencies said to have caused the failure of 'command and control' conservation based on legal prohibitions and boundary policing (Pagiola *et al.*, 2002).

Private ownership of ecosystems and their services is expected to ensure that conservation goals will be achieved voluntarily. In theory, once the values of nature's attributes are known, property owners will act to maintain or increase those values. Market-based PES, by the economic definition of market exchanges, necessarily benefit both buyers and providers. Moreover, within the closed circuit of the market-world, sales of ecosystem services or other environmental property – or of any asset – entail no net costs to 'society' because they merely convey utility from one user to another (Wunder *et al.*, 2008).

Market rhetoric harmonizes with the version of environmentalism based on private-sector partnerships that emerged from Earth Summit +10

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and now figures prominently in programmes of the Global Environment Facility (GEF), other multilateral institutions, and, increasingly, UN agencies. But market rhetoric, as we have seen, is at odds with PES practice, and closer scrutiny of theory behind it reveals a deeper danger.

'Markets' cannot be both efficient and equitable at the local level ...

The central pillar of the argument for markets in nature is that properly managed trade in environmental assets will steer investments in greening towards those places and activities where conservation can be carried out most cheaply. This is the foundational rationale for all cap-and-trade systems for managing pollution. Applied to PES and REDD, however, market-efficiency logic would reinforce urban–rural, generational, and North–South inequalities.

First, PES measures that intentionally channel benefits to the poor introduce the very sorts of politicized decision making and 'market distortions' decried by conventional (neoclassical) economists. It is more labour-intensive to enrol many smallholders and monitor their compliance with project requirements than to pay a lesser number of larger-scale landholders. In the language of institutional economics, there is an inverse relationship between scale and transactions costs. It is often more expensive to involve less literate people, women, those who lack formal property titles, or indigenous and other groups who hold land in common. Thus, criteria meant to prioritize the poor in PES or REDD projects may be ruled out on economic-efficiency grounds (McAfee, 2012).⁹

Market-oriented policies use so-called opportunity costs as the way to decide where in the world and from whom ecosystem services should be purchased. Opportunity cost refers to a benefit that somebody gives up in order to obtain something he or she prefers. Economists engaged in PES design view opportunity cost as a neutral benchmark for determining the proper amounts and appropriate recipients of payments (de Janvry and Sadoulet, 2006). In practice, this is anything

but neutral. Opportunity-cost criteria disguise the power relations that determine *whose* opportunities are more or less costly and *whose* land-use choices shall prevail and avoid consideration of *how* some people's opportunity costs became higher and *why* others' remain low.

Relatively well-off people are generally in a better position than the poor to profit from deforestation. They are more likely to control larger holdings, possess property titles, have access to markets and funds, or credit to hire labour or buy machinery, livestock, or fertilizer. Their opportunity costs are therefore relatively high and their ecosystem-services payments would need to be correspondingly high. It would be inefficient to use scarce funds to pay them to conserve (Chomitz, 2006). More environmental benefit per dollar, rupiah, or peso can be gained by paying small- and medium-scale farmers, ranchers, or loggers to limit their activities than by paying the rich, such as soya or palm-oil plantation owners or logging and mining firms. It would likewise be inefficient to pay those too poor to convert their land profitably to pasture or plantations.

In addition, global ecosystem-services markets require that human–nature interactions that produce environmental services be constructed as discrete, fungible units amenable to commodification and transnational trade. The concept CO₂e has been constructed to compare the damage caused by different GHGs. But the choice of what is to be measured and the definition of what is 'equivalent' entails political decisions that inevitably favour some places and some categories of GHG-producing activities over others (Agarwal and Narain, 1991).

This points to a contradiction at the heart of the market paradigm linking conservation and development. The more strictly the fate of ecosystem-service-producing land is determined by the logic of market efficiency, the more likely it becomes that environmental-services trading will reinforce existing inequalities in localities targeted for PES-based conservation or REDD/REDD+. Conversely, ecosystem-services projects designed primarily to support the poor will rarely meet market-efficiency standards.

Moreover, the kind of economic development that would result in higher monetary incomes would also make conservation options more expensive. Consequently, continued or even increased inequality in the distribution of environmental benefits and burdens is practically inevitable in ecosystem-services markets designed to maximize economic efficiency.

... *nor internationally*

This has serious implications for REDD programmes financed by carbon trading. According to the World Bank, for-profit investments are expected to raise the bulk of the funds to finance REDD and also spur economic growth (Watson, 2007; World Bank, 2010).^{10,11} Advocates often describe conservation and development objectives as mutually supportive. But, to the extent that global schemes are financed by for-profit investors, they require the continued existence of inequality in incomes, land values, and development options between the world's wealthiest and its poorer regions.

The existing power/wealth differential has been tangible in the difference between the market price of carbon credits in different world regions. Before the recent crashes in European and other carbon markets, emissions offsets to pay for conservation or pollution avoidance in the Global South were being sold for a fraction of the cost of offsets derived from comparable activities in the Global North. These contrasting prices reflect the comparative costs of providing tradable environmental services or installing greener technologies in the two world regions.

Offsets are cheaper where opportunity costs are low. Opportunity costs are low where incomes and property prices are low. Since they could earn less than could their northern counterparts by felling or selling forests, southern states and people are expected to accept less compensation for conserving. In the market-world, labour, land, and lives are cheaper in most of Asia, Latin America, and Africa.¹²

For ecosystem-service markets to be profitable and efficient, even while transferring resources to the Global South, land, labour, and lives must

remain cheaper there. That is because the option of buying carbon credits cheaply for profitable use or resale is the source of incentive for private investments global carbon banking. This apparent conservation bargain makes it seem possible to avert climate disaster while avoiding major 'lifestyle' adjustments, that is, without wealth redistribution and without the major public policy changes and planned investments that, realistically, are needed in order to bring about a shift to low-carbon economies.

Eco-market ambitions and alternatives

My intention is *not* to argue that PES and REDD cannot transfer useful resources to poor people, nor that ecosystem-services payments can never foster sustainable resource management. Under the right circumstances – mainly where recipient communities are well organized and able to define their own development goals – CES may help sustain viable eco-social systems and even support equitable rural development.

Nor do I object to paying governments for conserving forest and wetlands in ways that do not dispossess indigenous and other rural communities. On the contrary, such transfers are the *sine qua non* of any reasonably fair – and therefore, feasible – strategy to prevent disastrous global warming. Rather, my point is this: the more that strategies for conservation compensation are conceived as 'markets', the more difficult it will be to achieve conservation and development objectives simultaneously.

PES and REDD are largely being framed under the intellectual hegemony of the world-as-market model, coincident with the escalating ambitions of environmental-economic management entrepreneurs and technicians. By encompassing multiple eco-social systems within a global market economy of nature, this approach would reinforce existing patterns of property claims and resource control. The values of nature, and thus the fates of particular natures, would be determined even more fully than they are today by those with the greatest discursive dominance and purchasing power worldwide.

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Policy based on the commodification of nature would intensify the ecological unequal exchange that has long characterized South-to-North resource flows. It would obscure and displace myriad existing, place-specific, nature-society relationships, many of which are relatively

sustainable and have much to teach, as well as learn. But as new social movements and communities are proving in practice, other understandings of sustainable development and green economies are possible (Escobar, 2010).

Notes

- 1 In addition to reducing emissions from deforestation and forest degradation, REDD + is meant to support forest conservation, sustainable management and enhancement.
- 2 On the rush for land, see *Development* 54(1), also see *Journal of Pleasant Studies*, forthcoming 2012 issue: 'Green Grabbing: A new appropriation of nature'.
- 3 *Carbon Finance at the World Bank: Frequently Asked Questions*, <http://web.worldbank.org/wbsite/external/topics/environment/extcarbonfinance/0,,print:yiscurl:ycontentmdk:21848927menupk:4125939pagepk:64168445pipk:64168309thesitepk:4125853,00.html>, accessed 25 April 2011.
- 4 World Bank funding for planning and pilot programmes has been approved for more than 35 countries. Proto-REDD projects have been launched under the aegis of UNREDD with funds and technical support dispersed via the UN Development Programme, GEF and other agencies, and by government and non-government agencies.
- 5 Although forest ecosystem services trade is a minor component of the Kyoto Protocol's Clean Development Mechanism (CDM), the World Bank views the CDM as a model for REDD and REDD +. Also see Notes 3, 6, and 7.
- 6 *Guidelines for pro-poor payments for environmental services*, <http://siteresources.worldbank.org/INTEEI/Resources/ProPoorPES-2col.pdf>, accessed 26 April 2011.
- 7 *Estimating the opportunity costs of REDD +: A training manual*, <http://wbi.worldbank.org/wbi/learning-product/estimating-opportunity-costs-redd>, accessed 27 August 2011.
- 8 This debate is muddled by confusion between for-profit markets as a *source* of financing for REDD and markets as *mechanisms for disbursing* such funds to suppliers of ecosystem services. (Personal Communication: Jutta Kill, FERN).
- 9 PES schemes 'cannot, for example, target their interventions to areas of high poverty, as these may not be the areas that generate the desired services. PES programmes also cannot choose to promote particular land use practices solely on the basis of the poor being able to undertake them' (Pagiola *et al.*, 2005: 238).
- 10 *FCPF makes headway towards a future with REDD +*, <http://web.worldbank.org/wbsite/external/topics/environment/extcarbonfinance/0,,contentmdk:22751912pagepk:64168445pipk:64168309thesitepk:4125853,00.html>, accessed 26 August 2011.
- 11 *World Bank eyes network of CO₂ markets in make-or-break decade*, <http://www.bloomberg.com/news/2011-06-06/world-bank-eyes-network-of-co2-markets-in-make-or-break-decade.html>, accessed 26 August 2011.
- 12 Similar logic informed the infamous 1991 memo signed by the World Bank's then-chief economist, Lawrence Summers, which argued that Africa is 'under-polluted' because lives cut short by pollution there are worth less, according to 'impeccable' economic reasoning.

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