

Payments for Ecosystem Services in Mexico: Nature, Neoliberalism, Social Movements, and the State

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ABSTRACT

A new generation of projects in the global South is intended to “market nature” by means of Payments for Ecosystem Services (PES). Project advocates contend that markets in biodiversity, carbon storage, and hydrological services can combine conservation and sustainable development. Mexico’s national PES programs expose the contradictions of neoliberal environmental discourse and policy based on binary categories of nature and society. With World Bank support, the Mexican scheme was planned as a model of efficient, market-based management. However, efficiency criteria have clashed with anti-poverty goals and a developmental-state legacy not yet extinguished by neoliberal restructuring. Like other projects for commodification of nature discussed by geographers, Mexico’s PES program is a hybrid of market-like mechanisms, state regulations, and subsidies. It has been further reshaped by social movements mobilized in opposition to NAFTA and anti-rural policies of the federal state. These activists see ecosystem services as co-produced by nature and campesino communities. Rejecting the position of World Bank economists, they insist that the values of ecosystems derive less from the market prices of their services than from their contributions to peasant livelihoods, food production, biodiversity, and wider social benefits that cannot be quantified or sold. These divergent conceptualizations of environmental values reflect contrasting understandings of socionature and of the roles of agriculture and the state in sustainable development. The Mexican case further suggests that conservation policies in the global South, if imposed from the North and framed by neoliberal logic, are likely to clash with state agendas and indigenous development goals.

Keywords: *commodification of nature, development, ecosystem services, Mexico, neoliberalism*

INTRODUCTION

Commodification of nature is a leading environmental policy trend. A new generation of programs under the rubric of payment for environmental services (PES) is based on the premise that the natural environment can best be safeguarded by valuing and managing “nature’s services” as tradable commodities.¹ Market-oriented projects for carbon trading, water provision, and conservation of biological diversity are being expanded beyond North America and Europe to Asia, Africa, and most extensively, Latin America. PES programs are sponsored by the World Bank, governments, conservationist organizations, and for-profit enterprises. Some supporters of these schemes view them strictly as tools for cost-effective conservation. Others expect that markets in ecosystem services, by generating profits and transferring revenue to cash-poor countries and communities, can simultaneously achieve global conservation gains, foster greener economic growth, and alleviate poverty in the global South: a triple-win solution for nature, private investors, and the poor. This article offers a critical analysis of Mexico’s national PES programs to show how the idealized, market-efficiency narrative of PES is contested and hybridized through encounters with grounded, social realities and to draw some broader conclusions about the commodification of nature.

The discourse of environmental services commodification resonates with the neoliberal rhetoric that has come to pervade international environmental policymaking (Liverman 2004; Liverman and Vilas 2006). PES policies and projects are neoliberal in that their advocates contend that market-based management will yield optimal gains because markets allocate scarce conservation resources more efficiently than do “command-and-control” regulation by states or international treaties (Pagiola, Arcenas and Platais; 2005, Wunder 2005). This idea conforms to the logic of neoclassical economics from which neoliberal ideology is substantially derived. The discourse and practices of PES are neoliberal also in that, by constructing aspects of nature as tradable commodities, they extend commodity relations into realms heretofore regarded as distinct from “the economy” (McAfee 1999; Heynen et al. 2007).

Recent debates in geography have wrestled with the concept of neoliberalism, the contradictions of “actually existing neoliberalisms” and the neoliberalization of nature in particular. (Braun and Castree 1998; Brenner and Theodore 2002; Peck and Tickell 2002; Castree 2003, 2006, 2008a, 2008b; McCarthy and Prudham 2004; Barnett 2005; Heynen and Robbins 2005; Smith 2007). The commodification of environmental services has been addressed by geographers mainly in Robertson’s work on U.S. wetlands (2000, 2004, 2007). Case studies and critical reviews of projects for market-based management of water, wildlife, wetlands, fish stocks, and forests have found that such projects are complex, varied, context-dependent, and often highly contested (Mansfield 2004; Prudham 2004; Bakker 2005; McCarthy 2005; Robbins and Luginbuhl 2005; St. Martin 2006) Neoliberal models for measurement, economic valuation, and marketing of resources and ecosystem functions tend to falter when they encounter natural cycles and non-human agents that resist quantification and predictability. Neoliberal environmental management strategies must also contend with social institutions at scales ranging from the national state to the local norms and practices of resource users: fishers, forest dwellers, ranchers, water consumers, etc. Following Larner (2003), some geographers characterize the resulting regulatory processes as hybrid neoliberalisms.

¹ “Environmental services” and “ecosystem services” are both used in policy discourse. We use the term ecosystem services because “environmental” services also has a second meaning: services, such as toxic waste clean-up, emissions-reduction technologies, or environmental impact assessments, that are provided by people or businesses.

This article begins by analyzing international debates about the discursive practices of PES. A burgeoning academic and grey literature on PES illustrates a spectrum of positions ranging from strict application of market-oriented reasoning to complete rejection of private ownership and monetary valuation of nature. We then discuss the evolution of Mexico's national PES programs, arguably the world's largest and most complex. By examining how contrasting paradigms of PES are mirrored by actors in these programs, we show how the translation of PES schemes from paper to practice reveals tensions between the conservation-first, market efficiency, and "pro-poor" priorities endorsed by different PES advocates. We argue that the Mexican case reveals inconsistencies in the theory and practice of PES that arise from a contradiction at the heart of the project of neoliberalization of nature. The Mexican case demonstrates how the discursive and practical maneuvers necessary for the commodification of environmental services require that nature be decontextualized ecologically in order to create standardized, fungible units of value, and also that nature, in the form of the functions of ecosystems, must be disembedded socially. Thus, the design and implementation of PES along neoliberal lines depend upon an initial conceptual separation of nature and society.

However, this desocialization proves impossible in practice. The designers and institutional sponsors of putative markets in environmental services must engage the institutions and norms governing the terrains and communities where the environmental services targeted for sale are being produced. They must accommodate the state, with its own agendas and constraints, and the local landholders who are to be paid directly for environmental services produced on their lands. As they do in Mexico, these "environmental service providers" are likely to have their own formal or informal organizations, resource-management practices, development priorities, and values with regard to non-human nature. These practices and values often cannot be reduced to calculations of individual benefit maximization that are presumed by proponents of market-based PES to determine human behavior.² In Mexico, these institutions and norms have combined to confound the model of market-based conservation efficiency envisioned by the World Bank and the economists who initially designed Mexico's PES programs. These conflicted interactions have transpired at the levels of the Mexican federal state, nationally and locally organized social movements, and local *ejido* and indigenous polities.³

Neoliberal environmentalism begins from the conceptual separation of nature and society, then reconnects them by reductively constructing "nature" so that it can be encompassed within "economy". However, when the discursive practices of neoliberal environmental management are applied to inhabited nature -- living ecosocial systems such as those found in Mexico -- these essentialized categories break down. Moreover, when the neoliberal version of PES is applied, across geographic and social space, to "developing" countries, it derives part of its legitimacy from the claim that it is fostering development as well as conservation. It must enroll local agents, such as Mexican state agencies, nongovernment organizations (NGOs), and community assemblies, on the basis of that claim. This generates conflict because society is differentiated and structured by power relations and inequalities that cannot be admitted into the discourse of the neoclassically-based environmental economics that frames neoliberal PES. Similar discord is likely to emerge, we believe, when market-based management is pursued

² This article does not address the obstacles to commodification posed by the characteristics and agency of external (non-human) nature noted by geographers, although that, too, is a factor in Mexican PES.

³ This article focuses mainly on tensions between neoliberal PES, and the Mexican state and social movements, on the other. The response of local *ejido* and communal governance bodies is considered in Shapiro forthcoming.

elsewhere in environmental and climate-change politics, especially when these discursive practices span global North-South wealth gaps and state-local power gradients.

Such conflict materialized quickly and forcefully in Mexico's PES programs in part because of the relatively strong common property rights of ejidos and indigenous groups over the forested ecosystems targeted by the programs and because many of these communities were already mobilized against threats to their livelihoods posed by other neoliberal policies. In contesting the initial, neoliberal criteria for the distribution of payments in the national PES program, campesino and social-movement activists espoused an understanding of the nature-society relationship quite at odds with that implied by neoliberal environmentalism.

Between these discursive poles stands the Mexican state. The stances of the federal state and its forestry and environmental agencies are influenced by neoliberalism but are also shaped by concerns about national sovereignty over resources, a tradition of populist paternalism toward rural citizens, and the political vulnerability of elected regimes in the context of increased economic polarization and the slow-motion collapse of smallholder agriculture. These factors have contributed to the state's implicit resistance to the full program of modernization and global economic integration on neoliberal terms and have produced yet another set of PES discursive practices. The federal state adopted elements of the conservation-efficiency discourse but also co-opted some of the ideas of the rural social movements who contested the neoliberal version of PES. The state has incorporated the national PES programs into its agenda of "inclusive neoliberalism": anti-poverty policies meant to mask the social damage wrought by structural adjustment policies and the North American Free Trade Agreement (NAFTA). (On states and neoliberal nature see Peluso 2007; on inclusive neoliberalism see Craig and Porter 2006)

In Section II below, we describe the rise of environmental services and PES in international environmental policy and discuss the pertinence of hybrid neoliberalism to PES and the Mexican case. We present a typology of four paradigms of PES that we have encountered in academic and policy literature, making note of their differing assumptions with regard to the nature-society relationship. Section III analyzes Mexico's national PES program. We explain how the involvement of federal agencies and rural activists shifted the program's emphasis toward poverty alleviation, partially at the expense of putative efficiency in conservation spending, and how the program came to reflect a more complex paradigm in which environmental services are co-produced by communities and nature. In this conceptualization, farmlands and forests are understood as ecosocial systems. Landscapes are valued for their contributions to local subsistence, cultural identity, and rural development rather than being valued only as sources of environmental commodities for sale to outsiders. We suggest that this approach, while more complex and less amenable to globally standardized practices and measures of nature's values, is more likely to contribute to conservation objectives that are sustainable over time.

II MARKETING ECOSYSTEM SERVICES: DEFINITIONS AND DEBATES

Ecosystem services – henceforth ES in this article – are defined as ecosystem functions that are beneficial to humans: carbon sequestration, provision of clean and sufficient water supplies, and biodiversity conservation (Constanza et al. 1997; Daily and Ellison 2002). In contrast to natural resources such as timber or minerals, the values of which are realized when they are extracted and sold or used elsewhere, ES are produced in place and *ad infinitum* so long as the ecosystems that produce them remain resilient. Core premises endorsed by all advocates of

PES are: (a) that the monetary values of ES can be calculated or, at least estimated, (b) that ecosystem services themselves can be measured and offered for sale or remuneration (c) that market demand can be generated from those who benefit from ES, and (d) that the transfer of revenues from ES beneficiaries to those who manage the ES-producing landscapes will slow the degradation of these ecosystems. (Hanemann 1988; Fearnside 1989; Farber, Constanza, and Wilson 2002; Pagiola, Bishop, and Landell-Mills 2002).

PES programs are sponsored by international development agencies, governments, non-profit environmental organizations, industry associations, and profit-making ES brokerage firms.⁴ Funds generated by PES programs are paid to individuals, communities, enterprises, or governments who have sovereignty over or property or access rights to forest, pasture, wetland, or other ecosystems. The availability of payments is intended to motivate these landholders to manage their ecosystems more sustainably or to desist from using them altogether. PES guidelines usually recommend that payment amounts be calibrated to exceed slightly the providers' opportunity costs, such as the monetary values of trees they would have cut or the income from crops they might have grown had they not received ES payments to conserve forest.

In carbon ES markets, typical ES buyers are enterprises such as power or transportation companies that emit greenhouse gasses in excess of their voluntary targets or their allowances under national laws (Bumpus and Liverman 2008). To compensate for a portion of the damage they cause, under some circumstances GHG-emitting firms may purchase carbon "offsets". Revenues from offset purchases are meant to finance activities that mitigate global warming: cleaner industrial technologies, low-pollution energy generation, new forest plantations, or conservation of existing carbon sinks. An estimated US\$64 billion in carbon credits were sold and resold during 2007, more than doubling the size of the 2006 global carbon market (Capoor and Ambrosi 2008). In biodiversity ES markets, buyers include land developers who make payments to finance restoration of ecosystems similar to those destroyed by their projects, such as housing built on wetland sites. Other biodiversity ES buyers are tourism enterprises that profit from the presence of wildlife, or conservationists willing to pay to preserve species-rich habitats. In hydrological services markets, water users such as municipalities, manufacturers, resort hotels, or hydropower plants pay upstream landholders to engage in practices, such as maintaining or increasing forest cover and riparian vegetation, that are thought to increase water quality and quantity or control flooding.

In international environmental management discourse, the concept of ES is increasingly supplanting iconic ideas such as endangered species and wilderness. ES is the primary organizing idea in the *Millennium Ecosystem Assessment*, the contemporary equivalent of the Brundtland report that framed late-20th-century "global" environmental discourse (Brundtland Commission 1987; Millennium Ecosystem Assessment 2005). The goal of monetary valuation and merchandizing of ecosystem services appears in policy statements and project portfolios of UN agencies and multilateral development banks, state environmental agencies, and private international conservation organizations such as Conservation International and the World Wide Fund for Nature. Industrialized countries and multilateral agencies are looking toward the global south to offset greenhouse gas emissions through afforestation and avoided deforestation and degradation. A variety of international ES trading schemes have been established or proposed toward this end, notably the Clean Development Mechanism of the Kyoto Protocol on climate

⁴ As early as 2002, a survey of PES forest projects identified 287 cases of established or incipient forest-related markets in carbon sequestration, biodiversity, watershed protection, and landscape beauty (Landell-Mills and Porras 2002). The number and scale of ES projects in the global South has since multiplied.

change and proposals for achieving Reduced Emissions from Deforestation in Developing Countries (REDD). Since the 1990s, the World Bank has launched several funds for transnational trading of carbon emissions credits and has initiated PES schemes, projected to cost a total of \$365 million, in Costa Rica, Mexico, Colombia, Nicaragua, El Salvador, Panama, Venezuela, Kenya, and South Africa (World Bank 2007).

Competing conceptions of payment for ecosystem services

How can the values of ES be determined? Which places and which people should be eligible for PES payments? Can PES reduce poverty or even redistribute resources in support of rural development, or is poverty alleviation a distraction from the primary PES goal of conservation? Can ES markets promote rural development or are they more likely to dispossess small farmers and disempower indigenous communities? Disputes that parallel these debates among international conservation advocates have also arisen in Mexico's PES projects, but in forms particular to the Mexican context. Although many PES proponents do not fit neatly into one category, we divide international PES paradigms into four types:

1. *Conservation-efficiency PES*: Advocates include resource and environmental economists in academia, international development agencies, and government ministries. Stefano Pagiola of the World Bank contends that market discipline in PES makes it superior to wasteful, corruption-prone conservation policies that rely on state subsidies. "If the money is only coming from the government budget, there's no incentive to make sure the conservation is done right, no meaningful pressure in the system. Whereas if the forest conservers are getting money from service *buyers*, the buyers will hold them accountable. If the system doesn't work, they won't keep paying." (quoted in Ellison and Hawn 2005, 24). However, the criterion of conditionality that defines a market transaction – users will not pay if providers fail to provide the commodity – is rarely met in PES schemes. Sven Wunder, senior economist at the Center for International Forestry Research (CIFOR), concedes that the great majority of PES schemes in the global South are not actually markets and therefore are, at best, "PES-like" (Wunder 2007, 50).

These analysts prioritize conservation over social goals. Reflecting neoliberalism's desocialized notion of nature, they say that PES criteria must be determined by hard-nosed economics, informed by conservation science but unsullied by sentimental or political objectives (Chomitz 2006). "(N)either the community that fully safeguards its environment nor the impoverished farmer... will emerge on the scene as major sellers of environmental services. These groups do not constitute a credible threat, so paying them creates zero additionality... The ideal seller of environmental services is, if not outright environmentally nasty, then at least on the edge of becoming so." (Wunder 2007, 53). Following this logic, mixing poverty reduction with conservation would compromise PES efficiency. 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 programs also cannot choose to promote particular land use practices solely on the basis of the poor being able to undertake them" (Pagiola, Arcena, and Platais 2005, 238). Indirect benefits may trickle down to the poor as part of the benefits of conservation to "society". While projects can be designed to minimize anti-poor discrimination, direct benefits for the poor should be seen as positive side-effect, not a PES goal. In the Mexican national program, this conceptualization has been best represented by advisors from the World Bank.

2. *Pro-market, pro-poor PES*: Another view holds that ES markets designed for conservation can

also be “pro-poor”. This double PES rationale is endorsed by donor agencies and research centers such as the Ford Foundation, the International Development Research Centre, the World Agroforestry Centre (ICRAF), the Center for International Forestry Research, the United Nations Environmental Program, the World Conservation Union (IUCN), Forest Trends, The Nature Conservancy, and the World Resources Institute, among others. Because the rural poor are disproportionately the managers of ES-producing ecosystems, PES should be designed to foster management practices by the poor that enhance the carbon-storage and wildlife-sheltering functions of forests (Landell-Mills and Porras 2002; Molnar, Scherr, and Khare 2004). The poor also have a “comparative advantage” in the production of ES: “As it does not matter to the climate where emission reductions are achieved, sound economics argues for achieving them where they are least costly.” (UNEP 2005, 4). This idea is consistent the neoliberal view that conservation in the global South, where incomes are lower and land cheaper, is more efficient than conserving forests in wealthier world regions.⁵

However, advocates of pro-PES point out that policies framed by market-efficiency criteria alone are likely to bypass small-scale farmers and forest dwellers. Paying many smallholders is more complex than paying a few large landowners or the state, although technical assistance for ES providers’ associations can reduce these transaction costs. To analyze the trade-offs between project efficiency and involvement of the poor, some apply concepts and methods from institutional economics and collective action theory (Swallow, Meinzen-Dick, and van Noordwijk 2005; Swallow et al. 2007) Most proponents of this approach treat poverty alleviation as a benefit of greener capitalism: more sustainable logging, biodiversity prospecting, ES markets, and so on. While some see a role for governments in conservation, they project a depoliticized if not a desocialized conceptualization of nature-society relations. They rarely address the development responsibilities of states or the broader issues of power and structural inequalities at the national and global levels that affect local resource access and control. The team of Mexican and US scholars who initially designed national PES program for Mexico took this pro-market, pro-poor approach to PES.

3. *Compensation for ecosystem services*: Advocates of sustainable rural development have espoused the CES approach in reaction to the previous two conceptualizations of PES. They assert that conservation and poverty reduction are inseparable and that both depend on equitable development. They stress that rural communities practicing traditional resource stewardship deserve to be recognized and rewarded for the benefits they provide to wider society. According to the Salvadoran Research Program on Development and Environment (PRISMA), active ecosystem management is essential for the production of ES. CES programs must be designed to keep small-scale producers on the land and must include “defense and expansion of rights over natural resources” (Rosa et al. 2003). Breaking with the notion that the proper prices of ES can be determined through the workings of the market, PRISMA states that PES “requires broad valuation frameworks that transcend traditional economic valuation” (ibid). CES advocates stress that agroecosystems, not only forests, produce multiple ES and that valuation must also take account of the contributions of ecosocial systems to local livelihoods. They affirm that conservation policy is necessarily political and cannot be socially agnostic. Private actors may have a role in PES but governments should be accountable for “the conditions and rules under which these schemes operate” (53).

⁵ The consequences of this approach, which depends of continuing North-South and urban-rural inequalities, is explored in McAfee forthcoming.

CES can be a “catalyst for revaluing the role of rural spaces and of the rural communities that manage them” (ibid). Pivotal in this narrative is *revalorización del campo* (revaluation of the countryside), a goal articulated by the rural activists who challenged the initial iteration of Mexico’s national PES program. CES proponents have influenced and been influenced by the social movements that have gained momentum in the context of deepening rural crises in Latin America. In the 2004 *Manifiesto de Xochimilco*, campesino organizations from Mexico and Central America proclaimed, “You will not conserve nature by depopulating the countryside... To restore lost resources and equilibrium what is missing is the restoration of a sustainable rural economy, capable of use without destruction.” (CMDMIRP 2004, Point 12). In contrast to neoliberal discourse, in this narrative asserts that ecosystems are actively shaped and reproduced by people.

4. *Anti-PES*: In Mexico and elsewhere, some critics reject PES altogether on the grounds that it will further dispossess the world’s poor (Lovera 2004; Christiansen et al. 2005). They point out that to participate in ES markets, providers must cede at least partial control over the land, forest, and water resources that have supported them. The conceptualization of natural processes as subject to exclusive ownership and alienation, they say, undermines cultures of reciprocity and creates an artificial split between what people do “for nature” and what they do for themselves and each other. The logic of commodification is likely to cause division and disempowerment within rural communities, within countries, and between countries in the global South as would-be sellers of ES compete in globalized markets for nature. Thus, PES becomes a new means of resource enclosure at the expense of those with weaker bargaining power

Some Mexican critics have denounced the national PES program as a neoliberal Trojan horse (Ferguson et al. 2009). PES financing depends upon valuation of the activities and assets of rural communities in terms of the benefits that they provide for outsiders, particularly when the biodiversity or carbon sequestration services are “sold” to firms or conservationists in the global North. Therefore, they say, PES projects *devalue* the productive activities that campesino carry out for the sake of their own survival and happiness.

Mexican scholar-activist Andres Barreda interprets PES as an attack on rural collective life disguised by a pretense of pro-poor environmentalism (2004). He writes that PES continues the “avalanche” of assaults against the campesino economy that began with trade liberalization and removal of state support for smallholder production. Farm subsidies were replaced by rural antipoverty programs. These hand-outs may keep people alive, “reproducing labor”, but break their communal, productive relationships with the landscape. PES schemes are carried out, whether naively or deceitfully, under the banner of conservation, but they are intended to privatize the natural environment, Barreda says. This view concurs with the CES contention that ES are products of *socionature*, but sees little hope of transforming PES policy to reflect this.

The consequences of these divergent assumptions about nature and society are manifest in place-specific practice: the design and ground-level implementation of PES. The neoliberal orientation of the designers of Mexico’s national PES program – mainly Northern-based economists, ecologists, World Bank consultants – has collided with the priorities of Mexican state agencies, activist nongovernment organizations (NGOs), and campesino associations. The following section describes how these contrasts have been reflected in the program’s evolving structure and criteria for success.

III. THE CONFLICTED HISTORY OF THE MEXICAN FEDERAL PES PROGRAM

Along with Costa Rica, Mexico was an early testing ground for PES (Burstein et al. 2002; Brown and Corbera 2003). The largest project has comprised two federally funded programs: the *Payment for Ecosystem Services–Hydrological* (PSA-H) and the *Program for the Development of Markets for the Ecosystem Services of Carbon Sequestration, the Derivatives of Biodiversity, and to Promote the Introduction and Improvement of Agroforestry Systems* (PSA-CABSA). Both have been administered by the National Forestry Commission (CONAFOR). Between 2003 and 2006, more than US\$100 million⁶ in Mexican federal funds were distributed, 685,900 hectares of forested land were incorporated into the program and 1,175 contracts were signed, 90 percent of them with *nucleo agrarios*,⁷ By 2006, the programs had served an estimated 430,680 people (Bezaury Creel and Iglesias Gutiérrez 2007). In 2007, more than US\$150 million from the World Bank, Global Environment Facility (GEF) and Mexico’s executive branch was added to support a third phase (Table II). With continued support from the president’s office, Mexico’s national PES program is currently the largest in the world and one of the most ambitious in that it pays for multiple ecosystem services: hydrological, biodiversity conservation, carbon sequestration, and agroforestry (CONAFOR 2008).

The Mexican context: neoliberal reform and precarious peasant livelihoods

Mexico has been characterized as an exemplar of neoliberal reform, a “model for the rollback of state intervention” and one of the most promising of the “new globalizers” (Fox 1995, 3; Collier and Dollar 2002, 35). One might assume that Mexico would be an ideal site for a PES model based on market-efficiency criteria, but our research has found otherwise. Continuing state intervention in the rural economy, the persistence of peasant production and communal ownership, especially of forested land, and the growing ability of social movements to counter neoliberal discourse set the stage for contestation of the initial market orientation of the national PES program.

Nearly three decades of neoliberal policy trends have weakened Mexico’s historically state-led development project but have not erased it entirely. In 1982, Mexico virtually defaulted on its foreign debt. During 1980-1991, Mexico received thirteen structural and sectoral adjustment loans from the World Bank, more than any other country (Barry 1995). The accompanying reforms included investment deregulation, the end of import substitution policies, sales of publicly-owned enterprises, elimination of government marketing agencies for coffee and other primary products, and substantial reductions in import tariffs and price supports (Fox 2000; Liverman and Vilas 2006). In the agrarian sector, economic restructuring was marked by the removal of tariffs and import permits for agricultural goods, the end of farm production subsidies, and the dismantling of state-run agricultural institutions (Fox 1995).

Beginning in 1994, NAFTA-required tariff cuts facilitated increased food imports. The consequent contraction of domestic market prices for corn, beans, and livestock, along with cuts in state support for smallholder agriculture, made traditional rural subsistence and commerce

⁶ We use a conversion rate of 0.09 Mexican pesos/US dollar, the approximate average exchange rate for the time period (2003-2008) discussed in this article.

⁷ *Nucleo agrario* is an inclusive term that represents a variety of common property tenure systems legally recognized and codified by the Mexican State, including *ejidos* (peasant associations) and *comunidades* (indigenous communities whose tenure has historical precedence).

increasingly difficult. These trends were exacerbated by the polarizing consequences of Mexico's second major debt crisis and drastic currency devaluation in 1994. In the late 1990s and early 2000s, a drop in the international price of coffee, a crucial income source in parts of the south, further undermined precarious campesino livelihoods.

Since both PSA-H and PSA-CABSA use forest cover as a proxy for the production of ecosystem ES, they must necessarily focus on the *nucleo agrario* land. In contrast to many countries where the majority of forested land is held privately or by the state, an estimated 80 percent of forestland in Mexico remains under collective ownership (Bray, Merino Pérez and Barry 2005). 1992 saw multiple changes to Article 27 of the constitution and in federal agrarian, forestry and water-use laws (Instituto de Investigaciones Jurídicas 2007). This opened the door to partial privatization of commonly held land and the country's natural resources, which previously had been defined as federal property (Klooster 2003; Wilder and Romero Lankao 2006). Despite this legal change, communal ownership, management, and governance remain the norm in much of rural Mexico: between 1992 - 2006, only 1 percent of communal lands had been privatized (Assies 2008). And, while the constitutional reforms allowed the *nucleos agrarios*'s individual agricultural, grazing and housing parcels to be subdivided and sold, forested lands remain common property (Segura 2000; Merino-Pérez, 2004).⁸

The impacts of the federal state's withdrawal from rural development have been partially ameliorated by programs aimed at maintaining patronage and political control through "social liberalism" or "inclusive neoliberalism" (Fox 1995; Craig and Porter 2006). PROCAMPO replaces production subsidies with per-hectare payments to grain producers; PROGRESA pays mothers for ensuring school attendance and health check-ups for their children; PROCEDE maps the external and internal boundaries of *nucleos agrarios* as a step toward privatization (Fox 2005). The national PES programs evolved into another PRO-rural-development program – PROÁRBOL. Vestiges of the developmentalist state in the form of constitutional limitations and bureaucratic control have hindered efforts to impose market-based criteria for ES payments.

These federal rural programs have done little to stabilize campesino livelihoods. Rural social movements have attempted to fill the gaps by replacing state price supports and services with cooperatives, state credit agencies with credit unions such as that of the *El Barzón* alliance, and corporatist membership organizations with more radical, independent associations of rural producers such as ANEC and UNORCA, not to mention the Zapatista movement (EZLN).⁹ When the first national PES program was introduced in 2003, these movements were gaining momentum, twelve of them allied in *¡Movimiento El Campo no Aguanta Más!* (MECNAM), a national coalition demanding renegotiation of the agricultural chapter of NAFTA. After decades of homegrown experience following state repression in the late 1960s, and aided by links with international agrarian movements, these organizations became adept at appropriating environmental and social-liberal rhetoric (Bray 1997; Stolle-McAllister 2005; Harvey 2005). In place of the neoliberal conceptualization of ES values determined by market

⁸ According to Segura (2000), while the reforms disallowed the subdivision of communally held forest lands, it did change the property right structure such that the members of a *nucleo agrario* can form "private" companies by using their forest land holdings as shares. This company can then sell up to 20,000 ha of their forest holdings to private companies for forest management.

⁹ ANEC is the Asociación Nacional de Empresas Comercializadoras de Productos del Campo. UNORCA is the Unión Nacional de Organizaciones Regionales Campesinas Autónomas. EZLN is the acronym of the armed wing of Zapatista movement, which seized power in parts of the state of Chiapas in January, 1994. The Zapatistas continue to govern what they call autonomous zones in large parts of Chiapas.

forces, MECNAM representatives put forward a conception of ES values centered on campesino environmental stewardship and the contributions of rural ecosocial systems to national and local well-being. Their intervention had a significant effect on the evolution of Mexico's national PES programs.

The account that follows is based on our analysis of project documents and extensive interviews in Mexico and the United States with actors responsible for the Mexican PES program. Between October 2005 and October 2007, Shapiro attended program design committee meetings in Mexico and conducted interviews of national and regional officials, leaders of rural social movements who protested or participated in development of Mexico's PES program, non-profit organizations contracted to implement PES at the community level, and academic consultants and World Bank officials who have directly influenced the program. McAfee interviewed PES participants and critics during visits to Oaxaca and Chiapas and contributed to the analysis of project documents, conservation debates, and our interpretation of nature-society relationships in PES discourse.

Evolution of the Mexican federal PES programs

As noted above, some geographers have characterized processes that combine market-oriented restructuring with state and/or civil-society interventions as hybrid neoliberalisms (Larner 2003; Mansfield 2004; McCarthy 2005). Mexico's national PES program can aptly be deemed hybrid in that it combines market norms with anti-poverty goals with government rule making and institution building. Commodification of ES in Mexico has not proceeded in orderly stages of transfers from public to private ownership (privatization), introduction of profit- and efficiency norms and practices, and the offering of ES for sale (commercialization), followed by genuine market transactions (commoditization). (On these complexities of commodifying nature see Castree 2003; Bakker 2005). Although their sponsors hope that private buyers for Mexico's ES can be found within the country and abroad, putative Mexican ES markets, like similar projects in other regions, depend on public subsidies and taxes, bilateral and multilateral grants and loans, and private donations. Additionally, many PES projects aim to incorporate civil society alongside municipal governments in decentralized environmental governance. In Mexico, this has led to incorporation of project objectives that conflict directly with the principles of efficiency, minimal state involvement, and individual property ownership espoused by the PES programs' designers and advisers from the World Bank.

The program has evolved through three phases (Figure 1). The original planners envisioned a market-like arrangement that would increase the amount and efficiency of conservation funding, decentralize federal control, and bolster individual property rights. During Phase 1, these criteria were partially altered to include measures to benefit the poor and reinforce the role of federal agencies. During Phase 2, campesino movements and their allies challenged these federal agencies with a different conception of PES, one based on an understanding of ecosystems as actively constructed and maintained. Employing the rhetoric of revaluing the countryside, they called for more state support, greater control of project activities by rural communities, and revised eligibility criteria that would connect rather than counterpose conservation and smallholder agriculture. The resulting program, PSA-CABSA, combined market-like measures, state supervision, community planning, and poverty alleviation. In Phase 3, the federal state retreated from its tentative, conflicted engagement with rural social movements. However, over the objections of World Bank advisors, project criteria have been

retained that violate market-efficiency principles, prioritize the poor, and recognize the co-production of ES by people and nature.

Figure 1. Chronology of the evolution of the Mexican national payment for ecosystem services (PES) programs including the actors groups (*in italics*) involved in each major advance.

		International Actors	Mexican Federal State	Rural Social Movements
PHASE 1	2000	Strategic Forestry Plan 2025 calls for PES program		
	2001	<i>Finnish govt. & IADB</i>	<i>SEMARNAT</i>	
	2002	PES pilot program designed		MECNAM coalition
	2003	<i>Economists from World Bank & Univ. of California, Berkeley</i>	<i>National Ecology Institute (INE)</i>	<i>12 rural organizations & leftist political parties</i>
			PSA-H program implemented	Agreement with the Countryside (ANC) promises new PES program
			<i>National Forestry Commission (CONAFOR) with INE design team</i>	<i>Executive branch to MECNAM</i>
PHASE 2	2004	PSA-CABSA program implemented		
	2005		<i>CONAFOR, INE, SEMARNAT, & CNA</i>	<i>MECNAM Reps. (CNOC, CEPCO, Red-MOCAF, UNOFOC, SAO, UNORCA)</i>
PHASE 3	2006	Loan & grant to expand & marketize PES programs	PES programs merged into PROÁRBOL	MECNAM reps. removed from PSA-CABSA committee
		<i>World Bank & GEF</i>	<i>CONAFOR</i>	<i>CONAFOR to MECNAM</i>
	2007		Funding for PES quadrupled	
	2008	World Bank Forest Carbon Fund grant to develop REDD protocol		
		<i>World Bank</i>	<i>CONAFOR</i>	

Phase 1 – PSA-H

The PSA-H payments for hydrological services program was initially framed by conservation priorities and market discourse. Parcels on forested lands in overexploited watersheds were to be eligible for ES payments. Payment amounts were to be based on calculations of participating landholders’ opportunity costs: the amounts that these ES "sellers" might have earned had they chosen to plant maize instead of protecting trees. The subsidies that funded these initial payments were to be gradually replaced by market-like contracts with water-scarce municipalities downstream. However, as these market-efficiency ideals encountered Mexican federal politics and norms, PSA-H incorporated central roles for state agencies and its distribution of payments reflected poverty-alleviation goals at odds with market-efficiency guidelines.

A national PES program for Mexico was first discussed by a federal climate-change working group between 1995 and 2000 (Alix-Garcia et al. 2005). PES then appeared as a proposal in the Strategic Forestry Program 2025, a result of collaboration between the Mexican Secretariat for Environment and Natural Resources (SEMARNAT), the Inter-American Development Bank (IADB), and the Finnish government (CONAFOR 2002). That proposal notes that Mexico's diverse and extensive forests offer enormous potential for carbon sequestration and a comparative advantage in selling biodiversity protection services internationally. This formative document presents PES as a market-based conservation solution and makes little mention of likely socioeconomic effects.

The task of designing a national PES program was given to the department of Policy and Environmental Economics at the National Institute of Ecology (INE), a federal research agency. INE's design team included INE staff and economists from Mexican universities and the University of California (Alix-Garcia 2005). Despite differences of opinion within the INE-led design team, the plan it produced generally reflected the *pro-poor, pro-market* model of PES summarized above. The World Bank funded preliminary data collection and evaluation. The Bank's Mexican office formed an advisory committee of academics and representatives from environmental organizations and municipal officials but the committee had little impact on policy formation (Muñoz Piña et al. 2006). Responsibility for implementing the national PES program was eventually assigned to the National Forestry Commission (CONAFOR).

Neoliberal analysts see PES as one means of decentralizing environmental management and reducing state control of resources (World Bank 2007). However, a history of federal control of natural resources still shapes Mexican political culture, even after attempts at devolution and privatization through rounds of structural adjustment and the constitutional reforms of the 1990s. Throughout the PSA-H process, criteria for market-like ES pricing and decentralized administration were rejected or altered as they clashed with priorities of the federal state. A member of the World Bank's PSA-H advisory committee opined that, "Mexico is a state that can't let go of itself, but that is precisely what needs to happen if PES is to succeed" (Interview 9 March 2006).

Mexican state resistance to market-based ES management

The PSA-H program focused on water quality and quantity, using forest conservation as a proxy for production of these hydrological services. Eligible plots had to be at least 80 percent forested and were to be set aside under a no-touch policy for the five-year duration of the PES contracts. There were political and pragmatic reasons for this strict emphasis on "natural" forests. In Mexico, conservation of forests and water were SEMARNAT priorities. Water supply seemed to be the ES with the most identifiable potential market (Alix-Garcia, de Janvry, and Sadoulet 2006). The INE-led team was also aware that, despite scientific uncertainties about the relation of forest cover to water flows, "there is a strong belief among Mexicans that forests play an important role in water supply." (Muñoz-Piña et al. 2008, 727). In contrast, visibly managed landscapes such as pasture, cropland, and agroforestry systems in Mexico, as elsewhere, are often perceived as "degraded", a state to be remedied by planting trees (Fairhead and Leach 1996; Mathews 2006). This emphasis on forest conservation illustrates the design team's approach to nature as distinct from society and its disregard of the underlying causes of land-use change.

The PSA-H design team, in its attempts to introduce market criteria, clashed frequently

with the federal state. The team recognized that PSA-H would function initially as a monopsonistic, non-competitive “market” with the federal government as the sole ES buyer, but expected that direct contracts could be established between producers and beneficiaries of hydrological services. To launch PSA-H, Mexico’s congress allocated a US\$1.6 million share of federal water-fee revenues. The Ministry of Finance classified these funds as a “subsidy” as opposed to a “payment for service”, which undermined representation of the project as market-based. Under Mexican law, “subsidy” funds must be distributed by a federal agency. This thwarted the design team’s intent to decentralize control of program funds and participant selection to the state level. Project funds were held in a trust through the Mexican Forest Fund (FFM) and distributed in yearly increments by CONAFOR. Thus, administration of the project remained squarely under federal control.

Determination of payment amounts was also politically fraught and underscores the government’s reluctance or inability to implement market-based conservation. The design team had proposed that rates be calibrated so that the owners of parcels at greater risk of deforestation and/or with greater potential to produce hydrological ES would receive higher per-hectare payments (Alix-Garcia, de Janvry, and Sadoulet 2006). As an additional means to optimize efficiency, the team had recommended reverse auctions: landowners would compete to qualify for payments by bidding to conserve their forests for the lowest price (Muñoz-Piña et al. 2006). CONAFOR rejected these proposals as logistically overcomplex, but also because it would be politically problematic to pay some participants more per hectare than others. Instead, CONAFOR opted for a more egalitarian formula: a fixed amount per hectare with a cap on land area per participant.

CONAFOR conceded to slightly higher payments for cloud-forest parcels, considered by the consulting ecologists to be most important for water provision. CONAFOR made two other, market-oriented concessions. PSA-H would be limited to sites with a potential demand for hydrological services, i.e. in watersheds classified as overexploited and located upstream from population centers of greater than 5,000. This was meant to increase the chances that participants would find buyers for their ES. To discourage dependence on subsidies, CONAFOR also limited the payment period to five years, during which participants were expected to develop ES sales agreements with downstream water users.

The 1992 constitutional reform that legalized privatization of common property is one of the most contentious neoliberal policies in Mexico, seen by critics as weakening the autonomy and tenure security of rural communities. The PES designers stepped squarely into this controversy by recommending that, in the case of *nucleos agrarios*, payments be made directly to individual households. Analyses by design team members of drivers of deforestation had concluded that payments to individuals would be more efficient (Alix-Garcia, de Janvry, and Sadoulet 2004). However, CONAFOR opted to distribute funds directly to the governing bodies of the *nucleos agrarios*’s communal lands, in effect electing to support common property rights.

The design team’s pro-market orientation was not was not entirely consistent. In line with a conceptualization of PES as both pro-market and pro-poor, some members proposed targeting communities classified by the Mexican government as marginalized or highly marginalized.¹⁰ This stipulation was not adopted. Another anti-poverty provision the team proposed was an upper limit of 2,000 eligible hectares per ES recipient so that large-scale landowners would be excluded. CONAFOR agreed instead to an upper limit of 5,000 hectares.

¹⁰ “Degree of Marginalization” is a classification calculated at the municipal level by the Mexican federal bureau of statistics (INEGI) based on a various socioeconomic indicators including income.

In final form, PSA-H policy was a medley of market-like mechanisms, strong federal control, and site selection based on conservation, market potential, and poverty-alleviation criteria. CONAFOR mapped eligible zones and posted the maps on its web site. Five-year contracts were signed and payments made annually, after verification by satellite image or ground visits that the enrolled land remained forested. Hectares where clearing was detected were removed from the program and payments were reduced proportionally. Payments rates were based on a calculation by a U.S. academic consultant of the average opportunity cost of land conversion from forest to maize crops. Payments were set at US\$36.40 per hectare for cloud forest and \$27.30 per hectare for other forest types.¹¹ Importantly, only forest conservation, with no type of land management, was allowed, a reflection of the designers' lack of recognition of the role of local communities in producing and reproducing forested nature. This stipulation was soon challenged by social-movement activists and was reversed in the PES program's second phase.

Phase 2 – PSA-CABSA

A second federal PES program, PSA-CABSA, was launched a year later, in 2004. It was the outcome of intervention by rural social movement advocates on behalf of indigenous and other rural communities. With some success, they challenged both the market-efficiency-plus-poverty-relief narrative at the base of the PSA-H design and the norms of the federal agencies responsible for its administration.

In late 2002, a national coalition of rural social movements, *¡Movimiento El Campo no Aguanta Más!* (MECNAM), was formed to protest and attempt to reverse the damage caused by trade liberalization and the rollback of federal programs that had supported smallholder production. The core of the coalition comprised twelve independent rural organizations representing multiple economic sectors and regions.¹² MECNAM sought recognition by Mexican society of the positive economic, cultural, and environmental contributions of rural communities. The coalition called on the Mexican state to, “acknowledge the fundamental cultural role of agriculture and to break with the ideology that ‘development’ means to empty the countryside of farmers” (UNORCA 2007). Its demands included a moratorium on the phase-out under NAFTA of tariff protections for maize and other staple food crops and the incorporation of indigenous and *ejido* politics into the federal political process. MECNAM activists framed their goal as revaluing Mexico's rural regions (*revalorando el campo*): “The revaluing and restructuring of the national agricultural system with full participation by campesinos and with a foundation in the central objectives of food sovereignty, the multifunctionality of agriculture, revaluing of campesino agriculture, promotion of production for the internal market for export, profitability and stability of incomes, rural employment, sustainable agriculture and conservation of natural resources.” (MECNAM 2003)

In early 2003, following massive MECNAM protests in Mexico City and fifteen Mexican states, the federal administration agreed to negotiations. All rural policies were to be reviewed by advisory working groups in which MECNAM representatives could negotiate with state agencies. One focus of the Environment and Rural Development group was reform of PSA-H. Its

¹¹ For reference, the national minimum wage at the time was US\$9/day (MX\$101.22/day).

¹² Other organizations that rallied behind MECNAM included the El Barzón credit union, corporatist rural organizations (Congreso Agrario Permanente and Confederación Nacional Campesina), and leftist political parties (Partido Revolución Democrática, and Partido del Trabajo) (Rubio 2007).

members pushed to include managed ecosystems as PES-eligible, raise per-hectare ES payments, channel more funds to low-income communities, and restrict the number of private landholder beneficiaries (GEA 2003)

It was primarily coffee grower associations of the MECNAM coalition who engaged the PES process. From their experience with organic and shade-grown coffee, these organizations were familiar with “eco-friendly” export markets. Small-scale coffee producers, already hard hit by the removal of subsidy and marketing programs, had been struck by a global price crash in the late 1990s (Bacon et al. 2008). The co-founder of a state-level association of coffee cooperatives explained that,

“We were looking for anything we could do to keep coffee farmers from cutting down their plantations. We needed the subsidy from PES.” (Interview 30 November 2005).

On 28 April 2003, President Fox signed an *Acuerdo Nacional con el Campo* (Agreement with the Countryside) that detailed policy changes promised during negotiations with MECNAM-affiliated groups. (Diario Oficial de la Federación 2003). After some resistance by CONAFOR, a design committee for a new PES program was formed that included six representatives from MECNAM groups and officials from CONAFOR, the original INE design team, and two government ministries.¹³ The Ministry of Finance allocated US\$9 million of the money designated from the PSA-H program to fund a second PES program. Formation of the new program was a long and contentious process: more than 30 meetings were held before the rules of operation for PSA-CABSA were finalized.

Social-movement activists contest market-driven PES

The MECNAM representatives brought to the table a substantially different conception of PES than that of INE or CONAFOR. They objected to the idea, implicit in the PSA-H design, that PES was merely an incentive to landholders who would cut their trees unless they received payments. Instead, they stressed the active role that campesinos play in maintaining healthy ecosystems. Embracing a version of the third PES narrative described above, *compensation for ecosystem services*, they saw the PES program as an opportunity to institutionalize recognition of the environmental value of local stewardship and as source of economic aid to enable peasants to remain on the land. One of MECNAM members on the design committee said that PES

“is not just about sales and monetary gains. It is new form of relationship: between the city and the countryside; industries and campesino; developed countries and undeveloped countries; regions that are producers of waste and those that are producers of oxygen.” (Interview 22 November 2005)

PSA-H initially required that land enrolled in the program be set aside and in no way managed. In contrast, MECNAM representatives insisted that PSA-CABSA endorse active land management by communal landholders. Without claiming that local land-management practices

¹³ The new committee included representatives from CONAFOR, INE, SEMARNAT, the National Water Commission (CNA), two coffee producer associations (CNOC and CEPSCO), two community forestry organization (Red-MOCAF and UNOFOC), a recently created coalition of organizations implementing PES programs in Oaxaca (SAO), and a national network representing campesino and indigenous organizations (UNORCA).

are always ideal, MECNAM representatives depicted campesinos as knowledgeable stewards whose intervention is often necessary to prevent environmental degradation. They proposed that management plans, based on local knowledge and ecosystem particularities, be developed by the communities and intermediary organizations. They won the provision of separate, one-year funding packages to develop such plans, which could include activities such as removal of diseased trees, construction of fire breaks, fencing against livestock intrusion, and monitoring against poaching and illegal logging. At the end of the year, participants would submit the plans to CONAFOR as part of their application for the five-year PES program (see Table 1).

Stressing that agriculture and land management are not antithetical to ecosystem health, MECNAM-affiliated representatives fought to include payments for perennial crops, such as coffee, palm, cacao, vanilla vines, or rubber, grown in conjunction with shade trees. They argued that these complex agroforestry systems deliver multiple services and restore, “tree species of importance to the community as well as to the conservation of biodiversity” (Interview 16 June 2006). The National Union of Autonomous Regional Campesino Organizations (UNORCA), whose constituents are mainly small-scale grain producers, further demanded that introduction of new agroforestry systems onto annual cropland should qualify for ES payments.

CONAFOR and INE negotiators opposed including agroforestry in the new program. CONAFOR is a forestry agency without expertise in managing agricultural landscapes. They argued that inclusion of agroecosystems producing multiple services conflicted with their understanding of PES as applicable to “natural” forests producing a discrete environmental service with a clearly defined buyer. CONAFOR also cited the costs of coordinating participation of many smallholders. They argued that coordination of producers of forest-based ES is minimal since these lands are by law communally held, while agroforestry in Mexico is typically implemented on individually managed plots. MECNAM won inclusion of payments for improvement of existing agroforestry and conversion of cropland to new agroforestry areas. To minimize transaction costs, participants were to apply for payments as associations.

The MECNAM negotiators also differed from the federal agencies in their understanding of the role of PES in “poverty alleviation”. For INE and CONAFOR, both ES production and poverty alleviation could be accomplished by payments to the bank account of the nucleo agrario treasurer, plus yearly visits to ascertain how funds had been spent. MECNAM members were wary of poverty-relief programs that only provide monetary handouts. They viewed the PSA-H “no-touch” policy as a paternalistic approach that could accelerate the “abandonment of the forest and the people who live in forested regions.” (Merino-Pérez et al. 2004, 6). “The PSA-H did not have a great impact on the communities where they were implemented because there was no requirement that they actively manage (the forest), only that they not touch it.” (Interview with a MECNAM member, 16 June 2006). They argued that PSA-CABSA should require that payments be used for productive activities of long-term, local benefit, such as employment generation, infrastructure improvement, and training in the marketing of ES and ecosystem management and monitoring. CONAFOR did agree to let communities apply for separate funding to train local extensionists. Along with the support for active management, this provision moved CABSA further toward a more multifaceted conception of poverty alleviation.

MECNAM representatives preferred that the government continue to regulate and finance the PES contracts. They believed that if payments were generated from private sources, then industry “...would dictate what management must be done” (Interview 29 June 2006). MECNAM members believed that the federal government would be more likely to allow local management autonomy. They claimed that decisions based on local knowledge of the ecosystem,

rather than on generic templates of “good management” imposed by industry, would be better for both communities and the environment. This view runs counter to the premise of the market-efficiency narrative that private buyers will best hold producers accountable for the quantity and quality of ES specified in market contracts but is consistent with the neoliberal goal of decentralized resource management. Whether the government should continue to be the primary ES “buyer” or whether PES programs should focus on developing private markets is part of an ongoing debate in Mexico.

MECNAM representatives thus won significant concessions. Arguably, the PSA-CABSA policies (Table I) were more conducive than PSA-H to environmental restoration linked to local livelihoods and well being. However, PSA-CABSA has been criticized as overly complex and difficult to monitor.

Table 1. Payment Rates and Schedule Under the 2004 PSA-CABSA Program (2004)

Project development (1 year)	Up to US\$36,000: 60 % up front, 40 % after annual project verification
Project execution (5 years)	Will be made in 5 annual payments
1) Carbon Sequestration	US\$45/ton CO ₂ e +US\$0.11/ unit of social/ environmental benefit
2) Biodiversity conservation	Up to US\$45,000/ project/year, including costs of technical assistance
3) Conversion to agroforestry	Up to US\$90/ha/year
4) Improvement of existing agroforestry systems	Up to US\$36/ha/year and up to US\$45/ha/year if certified organic
Technical assistance for projects in execution	5 annual payments: 60 percent up-front , 40 percent after verification
1) Verification of ecosystem services produced	Up to US\$13,500/year
2) Training of extensionists	Up to US\$13,500/year
3) Technical assistance	Up to US\$22,500/year; more for biodiversity conservation projects

Following the first round of implementation of PSA-CABSA, the participation of MECNAM in program oversight was challenged and program funding was reduced by half every year from 2004 to 2006 (see Table II). CONAFOR attributed these cuts in part to low enrollment rates. However, from its inception, PSA-CABSA had received little backing or promotion from CONAFOR. One MECNAM-affiliated NGO representative interpreted the funding cuts as, “a form of vengeance on the part of the government because the campesino movements forced them to the table and made them make concessions.” (29 June 2006) In the third CABSA year, CONAFOR also removed introduction of agroforestry as a PES-eligible activity. However, it retained many elements that the NGO representatives had fought for, particularly payments for improvement of tree-shaded agroforestry systems. Pressure from coffee-grower associations helped to keep these managed ecosystems in the program, while markets for sustainably produced coffee provided evidence that these systems produce ES with recognizable monetary values.

Table 2. Participation, funding & land area for PSA-H y PSA-CABSA, 2003-2008

Year	Number participants**			Total funding allocated (US\$)***			Total hectares added		
	PSA-H	PSA-CABSA	Pilot	PSA-H	PSA-CABSA	Pilot	PSA-H	PSA-CABSA	Pilot
2003	272	---	---	\$16,943,371	---	---	126,818	---	---
2004	352	17	209	\$25,903,676	\$8,750,401	\$4,316,861	184,240	31,448	537,293
2005	257	25	20	\$23,186,700	\$4,720,500	\$314,959	169,031	26,989	20,434
2006*	241	24	50	\$18,360,233	\$2,066,155	\$436,497	127,016	18,876	66,459
2007	627	155	463	\$64,959,239	\$90,590,194	\$2,517,552	424,515	64,835	251,483
2008	727	381	3	\$59,652,999	\$27,463,419	\$50,408	324,155	130,736	6,165
Total	2,476	602	745	\$209,006,218	\$133,590,669	\$7,636,277	1,355,775	272,844	881,834

* In 2006, the PSA-H and PSA-CABSA programs were consolidated under the rubric of the larger PROÁRBOL program. We keep them separate here to demonstrate the relative support given to payment for hydrological vs. other ecosystem services.

** “Participants” can be individuals, *nucleos agrarios*, or associations (e.g. producer cooperatives, NGOs, etc.)

*** Funding is intended to cover all annual payments for that year’s cohort of participants for the full 5 years of the program.

*** For 2004-2006 PSA-CABSA provided payment for one-year pilot projects. In 2007 PSA-H began to fund pilot projects as well.

Fractured by internal disagreements and external pressures, the MECNAM coalition of rural social movements was functionally disbanded a year after its formation. Although then-President Vicente Fox had signed the Agreement with the Countryside in April 2003, the federal agencies responsible for implementing promised changes found myriad ways to subvert the substantive changes that MECNAM had advocated (Rubio 2007). The PSA-CABSA program was a partial exception. A MECNAM leader described it as, “one of the few processes in which the federal government accepted a multilateral process with the campesino and civil society organizations.” (Interview 29 June 2006). Although CONAFOR eventually removed MECNAM from direct involvement in oversight of PSA-CABSA, some of its organizations remained involved in the program’s third phase.

Phase 3 –PROÁRBOL

Retreat from engagement with rural social movements

In 2006, ostensibly to streamline administration, CONAFOR consolidated PSA-H, PSA-CABSA, and several other programs under a single program, PROÁRBOL. The PSA-H and PSA-CABSA oversight committees were disbanded. The new oversight committee selected for PROÁRBOL was much less diverse, with representatives from CONAFOR, SEMARNAT, and the “social, forest industry, forest management professional and academic” spheres but, no members from INE or the former MECNAM coalition (CONAFOR 2006). The Mexican World Bank office incorporated some of the disenfranchised MECNAM committee members into the PES policy advisory group, but the latter has no voting power in the new program.

Nevertheless, MECNAM’s involvement had a continuing influence. The director of PES programs for CONAFOR stated,

“Before, I thought of *ejidos* as only resource degraders. I learned that often they degrade only because they don’t have resources to invest in adequate management.” (Interview 17 November 2006)

He affirmed that he now recognized the importance of intermediary NGOs along with community technical assistance and monitoring. “You can’t just give out the money and expect that it will cause conservation.” MECNAM-affiliated member of the design committee claimed three main achievements from their participation: “It was accepted that active management is not antithetical to conservation; that the multifunctionality of ecosystems was recognized; and that, ultimately, it is not just a payment but a true contract.” (Interview 29 June 2007). These changes in officials’ understandings also played a role in CONAFOR’s resistance to World Bank pressure to re-introduce market-efficiency priorities in the 2007 PES program.

Even as the role of MECNAM waned, innovations that these activists had introduced influenced the integration of reforms from PSA-CABSA into the PSA-H program. Funding for project development and technical assistance were included in PSA-H in 2006. Participants began to be required to submit forest management plans and to use a portion of their payments for management activities. Another deviation from early PSA-H policy was increased emphasis on poverty alleviation. A study analyzing PSA-H participant selection in 2003–2005 estimated that 78 percent of participants lived in municipalities with “high” or “very high” degrees of marginalization. Environmental efficiency criteria had apparently been given lower priority: 61 percent of the participating parcels were classified as having a “low” or “very low” risk of deforestation and 79 percent were in areas without officially recognized problems of water scarcity (Muñoz Piña et al. 2006). These trends have become more pronounced with each round of participant selection. Few PSA-H and PSA-CABSA participants found buyers for their ES, but as early participants reached the end of their five-year contracts there was increasing political pressure to continue the payments. In 2008, CONAFOR made the decision to renew old contracts, moving these programs originally conceived as “market-based” even closer to being unabashed federal subsidies.

Mexican state resistance to renewed World Bank neoliberal criteria

In 2007, both the funding and number of participants in the Mexican national PES programs quadrupled from the previous year (Table II). New World-Bank and GEF financing brought renewed pressures to prioritize market-based conservation efficiency over the measures introduced by MECNAM. Despite this, negotiations between the Bank and the Mexican state resulted in a PES program that retains some characteristics introduced by social-movement activists. Moreover, interest and financial support from Mexico’s new president has enabled CONAFOR to maintain a *de facto* emphasis on poverty alleviation.

In May 2006, the federal government accepted a US\$45 million World Bank loan and a US\$15 million GEF grant to restructure and expand the PES program. Eight pilot regions were selected specifically for the development of ES markets. Launched in October 2007, the new phase is authorized through 2010 (World Bank 2006). President Felipe Calderón, narrowly elected in 2006 and under pressure to address the consequences of economic polarization, targeted PES as one of his top ten priorities. During 2007, Calderón twice allocated more generous matching funds for the program from the federal budget than was required by the World Bank. Program funding has increased times four since his election. PES market efficiency rhetoric fit Calderón’s neoliberal leanings, while the program’s conservation objectives are useful for demonstrating Mexico’s environmentalism to international conservationists. However, in his public addresses in Mexico, Calderón has emphasized poverty-alleviation dimension of the

PES program, repeating that, “We are helping the poorest populations of Mexico and, at the same time, protecting the forest.” (Calderón 2008).

World Bank advisers tried to reassert market-efficiency, conservation-first priorities. A project appraisal report commissioned and endorsed by the Bank attributes the deviation from the original, market-based ideal to the fact that program funding comes from the government and “is thus subject to political decision making” (World Bank 2006, 13). “Market-driven PES programs are more likely to be sustainable because they depend on the self interest of the affected parties rather than on taxes, tariffs, philanthropy, or the whims of donors” (3). Although one of the World Bank’s four main stated goals for the new project is “poverty reduction”, the assessor objected to the apparent channeling of ES payments to the poor. “Environmental service programs are not specifically designed to be poverty reduction programs” (13). Targeting aimed at poverty reduction “risks undermining (the) primary objective of generating valuable ecosystem services” (Ibid.).

The assessor’s report calls for greater emphasis on developing ES markets and reintroduction of market-like payment criteria to ensure “a greater area being conserved per dollar spent.” (23). It argues that the current system has been inefficient, “paying more than would be necessary to induce participation in some areas, while offering insufficient amounts to induce participation in others” (13). Echoing the INE design team’s original conception, the World Bank pressed CONAFOR to switch from flat rate payments to a system gradated by predicted risk of deforestation and opportunity costs. However, differentiated payments proved to be politically unviable and, to some, morally indefensible. A member of the CONAFOR PES team stated, “We are all Mexicans and we all deserve to be paid equally, just as we all deserve to benefit equally from the ecosystem services produced by our nature.” (Interview 3 October 2007).

During this period, World Bank advisers urged CONAFOR to eliminate ES payments for agroforestry. The Bank’s appraisal document concedes that managed ecosystems may be included in places with an insufficient, “area of original natural ecosystem” but also states that, “within any watershed selected for PES support, the prioritization criteria will tend to favor the conservation of native forests (or other natural habitats) over the maintenance of agro-ecosystems (such as shade coffee)” (World Bank 2006, 27). CONAFOR resisted this and maintained full funding for improvement of existing agroforestry systems, although the number of accepted applications dropped sharply. However, allocation of financial resources in Mexico indicates that the trend does not favor linkage of productive and conservation activities. A recent report on Mexico’s forest sector found that the few CONAFOR programs that supported integrated development of community forest management and productive activities were relatively underfunded and were directly competing with the higher payments and less stringent and onerous requirements of the PES and reforestation programs. (Merino Pérez et al. 2008, 169).

Notwithstanding World Bank misgivings about the lack of market development for ES, in 2008 the Bank’s Forest Carbon Fund selected Mexico as one of fourteen countries slated to develop REDD schemes (Wroughton 2008). CONAFOR was designated to develop a plan for production and sale of carbon credits generated by forest conservation. Despite a 2008 scandal over misuse of funds and low success rate of the reforestation component of PROÁRBOL, President Calderón continues to cite the program, particularly the PES component, as one of the capstones in his “Green Plan” that he claims will cut Mexico’s carbon emissions 50 percent between 2002 and 2050 (Tuckman 2009). However, in his push to make Mexico a leader in the

production of carbon offsets, Calderón has denounced private-sector carbon markets, strongly advocating the development of an international ‘Green Fund’ supported by emitter nations. (Stevenson 2009).

III CONCLUSION

The discourse of conservation by commoditization approaches nature and society as conceptually distinct. It then reconnects them by subsuming ecology within the market economy. By promising triple-win solutions for ES buyers, for ES sellers, and for nature, this neoliberal narrative attempts to depoliticize environmentalism, but without success. Conflicts over PES in Mexico suggest that ES commodification and other conservation policies framed by market logic are likely to clash with state agendas and with equity goals in the global South, particularly where rural social movements are mobilized in opposition to neoliberal policies.

As we have seen, advocates of market-based environmentalism contend that on-going public funding, state regulation, and political goals such as poverty reduction will undermine efficiency in the allocation of scarce conservation funds. Other PES advocates see gains for the poor as a worthwhile but strictly subsidiary benefit of PES. Still others regard the rural poor as key environmental managers and see equity as a primary consideration in PES projects. They assert that governments must subsidize and monitor ES markets and that PES accountability must not be left to private actors. These differences are linked to divergent views of the role of states and of the ability of markets to produce optimal outcomes. They are rooted in differing assumptions about human motives and practices with regard to nature and whether the productive use of "natural" landscapes is inimical to conservation. These disparities also reflect different understandings of the significance of rural life and agriculture in ecologically sustainable development.

The designers of Mexico’s initial national PES program saw it as a means of increasing conservation efficiency by decentralizing environmental management, but found that federal control of natural resources still shapes Mexican political culture. Their attempts to introduce market-like mechanisms were thwarted by state-centered compromises: set payments instead of reverse auctions, fixed funding instead of a percentage of the federal water tax, payments to communities rather than individuals, distribution of funds as a federal subsidy instead of through regional-state banks, and extension of state-funded PES contracts in the absence of established markets. Financial support from the president’s office has allowed CONAFOR to sidestep the World Bank’s push for market-oriented PES criteria. It has reinforced the dilution of the programs’ conservation priorities in favor the use of PES for poverty alleviation, albeit of a kind far weaker than the peasant-led rural development envisioned by Mexican social movements of the left.

Some Mexican activists, indigenous spokespeople as well as intellectuals, denounced the national PES program from the start. Others attempted to reshape the program by placing social justice at the center of the PES agenda and linking the goals of conservation and cultural survival. The contestations over PSA-H and PSA-CABSA in Mexico concerned whether these programs could generate a new category of value for the functions of ecosystems, and if so, who would measure and who would capture these values. Those MECNAM leaders who worked to reform PES viewed it not only as a source of emergency funds for farmers in desperate straights, but also as an opportunity to convince state agencies and urban Mexico of the environmental value of low-intensity smallholder agriculture and land-management practices. They sought to

appropriate PES as part of their project to “revalue the countryside”. In fighting for support for active ecosystem management, the training of local extensionists, and payments for agroforestry systems, these activists introduced a more multifaceted understanding of ecosystem services and how they are produced. In challenging the designer’s original emphasis on market development, the MECNAM representatives also reinforced the continued state control of the PES programs.

Some Mexican PES critics view engagement with a neoliberal-inspired policy, even to try to remake it a rural development program, as a dangerous game. Like past promises of profits from tropical export crops, they contend, the prospect of ES payments may tempt campesino and forest dwellers with the illusion of benefits from participation in the wider market economy while actually removing them from the development equation. It is too early to judge one side entirely right or wrong in the Mexican case. As critics of overly simple, debilitating depictions of the exploitative nature and omnipresence of market relations have pointed out, capitalist agendas can be co-opted and transformed in multiple ways by knowledge and action “from below” (Gibson-Graham 2006). Mexican rural social movements and NGOs continue their efforts to remold PES to support peasant survival and productive rural landscapes in conjunction with conservation.

PES schemes such as Mexico’s, in themselves, have little to do with development beyond the short-term transfer of payments to poor landholders. Mexico’s national PES program was not meant to tackle the wider causes of forest loss and ecological degradation, or to consider the obligations of states to their impoverished citizens. It was not intended to deal with the underlying causes of that poverty, a position that World Bank PES advisers defend (Pagiola 2007). Nor was the program initially designed to take account of complexities and inequalities in land tenure and resource rights, or locally and culturally specific landscape uses, resource values and development aspirations. Yet these ecosocial realities pose inescapable dilemmas for the officials and NGOs charged with implementing the program.

As our typology of PES paradigms and the Mexico case illustrate, the neoliberal PES narrative constructs human behavior as determined by individual, material self-interest. From this starting point, it privileges an abstract version of conservation, in which nature is measured by desocialized science and given value through the logic of supply and demand. It then seeks policies that will maximize environmental-market efficiency and thus yield the greatest conservation gain at the least cost for abstract “society”. Actually-existing society, with its time- and place-specific complexities, is set aside. The initial, historically contingent and unequal distribution of economic power and property rights in the market-world is taken for granted.

Contrary to the claim that objective ecological and economic science can reveal the “right prices” for environmental assets, the design of PES projects entails political choices about which classes of people, in which geographic locations, will have access to natural resources and their benefits now and in the future (McAfee 1999; Martinez-Alier 2003). Like other projects for commodification of nature, ES markets “necessarily imagine and legitimate particular social orders” (McCarthy and Prudham 2004, 277). As the Mexican case demonstrates, however, market rules can be challenged and social orders can be differently imagined in the context of myriad existing and possible, place-specific socionatures and alternate understandings of sustainable development.

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