

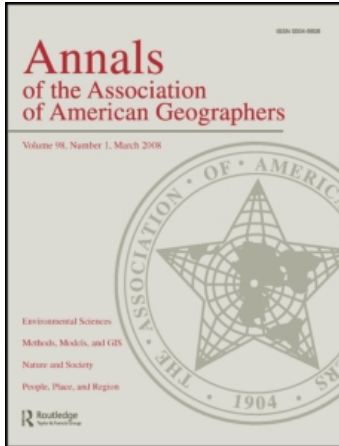
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Payments for Ecosystem Services in Mexico: Nature, Neoliberalism, Social Movements, and the State

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Prominent advocates of payments for ecosystem services (PES) contend that markets in biodiversity, carbon storage, and hydrological services can produce both conservation and sustainable development. In Mexico's national PES programs, however, conceived as models of market-based management, efficiency criteria have clashed with antipoverty goals and an enduring developmental-state legacy. Like other projects for commodification of nature, Mexico's PES is a hybrid of market-like mechanisms, state regulations, and subsidies. It has been further reshaped by social movements mobilized in opposition to neoliberal restructuring. These activists see ecosystem services as coproduced 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, biodiversity, and social benefits that cannot be quantified or sold. These divergent conceptualizations reflect contrasting understandings of the roles of agriculture and of the state in sustainable development. The Mexican case exposes contradictions within neoliberal environmental discourse based on binary categories of nature and society. It 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 local development goals. *Key Words: commodification of nature, development, ecosystem services, Mexico, neoliberalism.*

支持付费生态系统服务（PES）的著名倡导者争辩说，在生物多样性、碳储存、水文服务领域的市场化能够在保护环境的同时保持可持续发展。然而，在墨西哥的国家生态补偿方案（PES），曾被视为以市场为基础的管理模式和效率标准，实际上与反贫困的目标和持续发展的国家传统发生了冲突。类似于将大自然商品化的其它项目，墨西哥的 PES 是一种混合了市场机制，国家法规和补贴的综合体。该项目被旨在反对新自由主义改革的社会运动进一步重塑。这些社会运动的积极分子将生态系统服务视为本质上的共同生产和大量的农民社区。他们拒绝世界银行经济学家的立场，坚持认为生态系统的价值，从他们的服务所带来的市场价格比他们对农民生计、生物多样性和难以量化或出售的社会效益的贡献要少。这些不同的概念化反映出对农业的角色和可持续发展的状况的相对立的理解。墨西哥的案例暴露了新自由主义环境话语体系（基于自然和社会的二元分类）里的矛盾冲突。它表明，在南半球的环境保护政策，如果是由北半球强加于人并且是基于新自由主义逻辑框架的，有可能会和当地国家的发展规划以及地方的发展目标产生矛盾冲突。*关键词：自然商品化，发展，生态系统服务，墨西哥，新自由主义。*

Los más notables partidarios del pago por servicios al ecosistema (PES) sostienen que los mercados relacionados con biodiversidad, acumulación de carbono y servicios hidrológicos pueden generar conservación y desarrollo sostenible. Sin embargo, en los programas nacionales del PES de México, concebidos como modelos de manejo en el contexto de mercado, los criterios de eficiencia han entrado en conflicto con las metas contra la pobreza y un legado perdurable de desarrollo de estado. Como ocurre en otros proyectos para la comodificación de la naturaleza, el PES mejicano es un híbrido de mecanismos basados en el mercado, regulaciones gubernamentales y subsidios. Adicionalmente, el PES ha sido reconfigurado por movimientos sociales promovidos en contra de reestructuraciones de tinte neoliberal. Estos activistas conciben los servicios al ecosistema como algo coproducido por la naturaleza y las comunidades campesinas. En rechazo a la posición de los economistas del Banco Mundial, insisten en que los valores de los ecosistemas se derivan menos de los precios de mercado por sus servicios que de sus contribuciones al sustento campesino, la biodiversidad y los beneficios sociales que no pueden ser cuantificados ni vendidos. Estas conceptualizaciones divergentes reflejan la visión contrastada sobre los papeles que les corresponden a la agricultura y al Estado en el desarrollo sostenible. El caso mejicano pone de manifiesto contradicciones dentro del discurso ambiental neoliberal basado en las categorías binarias de naturaleza y sociedad. De ello se desprende que las políticas de conservación en el Sur global, si son impuestas por el Norte y enmarcadas con lógica neoliberal, están expuestas a chocar contra las agendas de Estado y las metas locales de desarrollo. *Palabras clave: co-modificación de la naturaleza, desarrollo, servicios al ecosistema, México, neoliberalismo.*

Commodification of nature is a leading environmental policy trend. A new generation of programs under the rubric of payment for ecosystem 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 presents a critical analysis of Mexico’s national PES programs. We show how an idealized, market-efficiency narrative of PES has been contested and hybridized through encounters with grounded, social realities and draw some broader conclusions about the commodification of nature.

The discourse of environmental services commodification resonates with the neoliberal rhetoric that pervades 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 “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, contradictions of “actually existing neoliberalisms,” and the neoliberalization of nature (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). Commodification of environmental services has been

addressed by geographers mainly in Robertson’s (2002, 2004, 2007) work on U.S. wetlands banking. 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 nonhuman 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, and so on. Following Lerner (2003), some geographers characterize the resulting regulatory processes as hybrid neoliberalisms.

This article begins by analyzing international debates about the discursive practices of PES. A burgeoning academic and gray literature on PES illustrates a spectrum of positions, from strict application of market-oriented reasoning to complete rejection of private ownership and monetary valuation of nature. Further, 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. The article then describes how contrasting PES paradigms have been mirrored by different actors in Mexico’s national PES programs, arguably the world’s largest and most complex. 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. It illustrates how the discursive and practical maneuvers necessary for the commodification of environmental services require that nature, in the form of the functions of ecosystems, must be decontextualized ecologically and disembedded socially to create standardized, fungible units of value. Thus, the design and implementation of PES along neoliberal lines depend on an initial conceptual separation of nature and society.

This desocialization proves impossible in practice, however. 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 various agendas and constraints, and the local landholders who are to be paid 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 nonhuman nature. These practices and values often cannot be reduced to the calculations of individual gain that, in neoliberal PES models, are expected 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 other economists who initially designed Mexico’s PES programs. These conflicted interactions have transpired at the levels of the federal state, nationally and locally organized social movements, and *ejido* and indigenous polities.³

Neoliberal environmentalism begins from the conceptual separation of nature and society and then reconnects them by reductively constructing “nature” so that it can be encompassed within “economy.” Yet when the discursive practices of neoliberal environmental management are applied to inhabited nature—living ecosocial systems such as those 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. On the basis of that claim it must enroll local agents such as state agencies, nongovernmental organizations (NGOs), and community assemblies. This generates conflict because society is differentiated and structured by power relations and inequalities that cannot be admitted into the neoclassically based economic discourse that frames neoliberal PES. Similar discord is likely to emerge, we believe, when market-based management is pursued 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 *ejidos* and indigenous groups have relatively strong common property rights to the forested ecosystems targeted by the programs and because many of them 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 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 contribute 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 coopted some ideas of the rural social movements that contested the neoliberal PES. The state has incorporated the national PES programs into its agenda of “inclusive neoliberalism”: Antipoverty 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 the next section we discuss the rise of environmental services in international environmental policy and the pertinence of hybrid neoliberalism to PES and the Mexican case. We present a typology of four PES paradigms that we have encountered in academic and policy literature, noting their differing assumptions with regard to the nature–society relationship. Following that, we analyze 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, subsequently, how the program came to reflect a more complex paradigm in which environmental services are coproduced 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, although 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.

Marketing Ecosystem Services: Definitions and Debates

Ecosystem services (ES) are defined as ecosystem functions that are beneficial to humans: carbon

sequestration, provision of clean and sufficient water supplies, and biodiversity conservation (Costanza 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 PES advocates are that: (1) monetary values of ES can be calculated or, at least, estimated; (2) ES can be measured and offered for sale or remuneration; (3) market demand can be generated from those who benefit from ES; and (4) the transfer of revenues from ES beneficiaries to those who manage the ES-producing landscapes will slow the degradation of these ecosystems (Farber, Constanza, and Wilson 2002; Pagiola, Bishop, and Landell-Mills 2002; Wunder 2005).

PES programs are sponsored by international development agencies, governments, nonprofit environmental organizations, industry associations, and profit-making ES brokerage firms. 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.

In carbon ES markets, typical buyers are enterprises such as power or transportation companies that emit greenhouse gases (GHGs) 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 can 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\$126 billion carbon credits were sold and resold during 2008, doubling the size of the 2007 global carbon market (Capoor and Ambrosi 2009). 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 former wetlands. Other biodiversity ES buyers are tourism enterprises that profit from the presence of wildlife or conservationists who 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 thought to increase water quality and quantity or control flooding, such as maintaining or increasing forest cover and riparian vegetation.

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-twentieth-century “global” environmental discourse (Brundtland Commission 1987; Millennium Ecosystem Assessment 2005). Monetary valuation and merchandising of ES is endorsed in policy statements and project portfolios of UN agencies, multilateral development banks, state environmental agencies, and private 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 GHG emissions through afforestation and avoided deforestation. 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 change and proposals for achieving reduced emissions from deforestation and degradation (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 does poverty alleviation distract 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 arisen in Mexico’s PES projects but in forms particular to the Mexican context. Although not all PES proponents fit neatly into one category, we discern four main PES paradigms:

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).

The criterion of conditionality that defines a market transaction—buyers will not pay if sellers fail to provide the commodity—is rarely met in PES schemes, however. Sven Wunder, senior economist at the Center for International Forestry Research, 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)

Mixing poverty reduction with conservation compromises 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 might trickle down to the poor as part of the benefits of conservation to “society.” Although projects can be designed to minimize anti-poor discrimination, direct benefits for the poor should be seen as a positive side effect, not a PES goal. In the Mexican national program, this conceptualization has best been represented by advisors from the central office of 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, 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. 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 an alleged competitive 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” (United Nations Environmental Program [UNEP] 2005, 4). This notion is consistent with the neoliberal view that conservation in the global South, where incomes are lower and land is cheaper, is more efficient than conserving forests in wealthier regions.⁴

Advocates of pro-PES, however, recognize 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 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. Although some see a role for governments in conservation, they project a depoliticized 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 U.S. scholars who initially designed the national PES program for Mexico took this pro-market, pro-poor approach.

3. *Compensation for ecosystem services (CES)*: Advocates of sustainable rural development have espoused the CES approach in reaction to the aforementioned PES paradigms. 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, 5). 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” (Rosa et al. 2003, 53). CES advocates stress that agroecosystems, not only forests, produce ES, and that valuation must take account of the contributions of ecosocial systems to local livelihoods. They contend that conservation policy is unavoidably political and cannot be socially agnostic. Private actors might have a role in PES but governments should be accountable for “the conditions and rules under which these schemes operate” (Rosa et al. 2003, 53).

CES can be a “catalyst for revaluing the role of rural spaces and of the rural communities that manage them” (Rosa et al. 2003, 53). 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*, Mexican and Central American campesino organizations 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” (Mesoamerican Campesinos Against the Dictatorship of the Market and for a Regional Integration of Rural Communities 2004, Point 12). In contrast to neoliberal discourse, 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 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 on 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 campesinos carry out for the sake of their own survival and happiness.

Mexican scholar-activist Andres Barreda (2004) interprets PES as an attack on rural collective life. 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 handouts might 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 or pro-poor environmentalism, but they are intended to privatize and “reproduce” 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, and World Bank consultants—has collided with the priorities of Mexican state agencies, activist NGOs, and campesino associations. The following section describes how these contrasts have been reflected in the program's evolving structure and criteria for success.

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 are administered by the National Forestry Commission (CONAFOR). Between 2003 and 2006, more than US\$100 million⁵ 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 *nucleos agrarios*.⁶ 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. With continued support from the president's office, Mexico's national PES program is currently one of the world's largest and most ambitious in that it pays for multiple ES: hydrological, biodiversity conservation, carbon sequestration, and agroforestry services (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” (Fox 1995, 3) and one of the most promising of the “new globalizers” (Collier and Dollar 2002, 35). One might expect Mexico to 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, 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. Between 1980 and 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 eclipse of import substitution policies, sales of publicly owned enterprises, elimination of government marketing agencies for coffee and other primary products, and substantial reductions in 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 small-holder agriculture, made traditional rural subsistence and commerce increasingly difficult. Even most conservative analysts concede that Mexico's campesinos have not benefited from the neoliberal reforms (Loyns et al. 2001). 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.

Because both PSA-H and PSA-CABSA primarily use forest cover as a proxy for the production of ES, they must necessarily focus on *nucleo agrario* land. In contrast to many countries where most forested land is held privately or by the state, about 80 percent of forest land 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 and 2006, only 1 percent of communal lands were privatized (Assies 2008). And, although the constitutional reforms allowed the *nucleo agrario's* individual agricultural, grazing, and housing parcels to be subdivided and sold, forested lands remain common property (Segura 2000; Merino Pérez, 2004).

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. Although the state has largely withdrawn from rural development, it maintains patronage and a degree of political control through “social liberal” or “inclusive neoliberal” programs (Fox 1995; Craig and Porter 2006). The Program of Direct Rural Aid (PROCAMPO) replaces production subsidies with per hectare payments to grain producers. The Program of Education, Health, and Nutrition (PROGRESA) pays mothers to ensure school attendance and child health checkups. The Program of Certification of Ejido Rights and Titling of Residential Plots (PROCEDE) maps the external and internal boundaries of *nucleos agrarios* as a step toward privatization. The national PES programs evolved into another “PRO” antipoverty program and forest conservation program, PROÁRBOL (Pro-Tree).

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).⁷ 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 and other reforms. 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; Harvey 2005; Stolle-McAllister 2005). In place of the neoliberal conceptualization of ES values determined by market forces, MECNAM representatives advanced 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 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, and NGOs 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 earlier, some geographers characterize processes that combine market-oriented restructuring with state 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 antipoverty goals and 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 engage 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 market efficiency, minimal state involvement, and individual property ownership espoused by the PES programs' designers and advisors from the World Bank.

The program has evolved through three phases (Figure 1). The original planners envisioned a

Figure 1. Chronology of the evolution of the Mexican national payment for ecosystem services (PES) programs including the actor groups (*in italics*) involved in each major advance. *Note:* IADB = Inter-American Development Bank; SEMARNAT = Mexican Secretariat for Environment and Natural Resources; MECNAM = ¡Movimiento El Campo no Aguanta Más!; PSA-H = Payment for Ecosystem Services–Hydrological; PSA-CABSA = 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; CNA = National Water Commission; CNOC = National Coordinating Committee of Coffee Producer Organizations; CEPCO = State Coordinating Committee of Organic Coffee Producers of Oaxaca; Red-MOCAF = Mexican Network of Peasant Forestry Organizations; UNOFOC = National Union of Community Forestry Organizations; SAO = Environmental Services of Oaxaca; UNORCA = Unión Nacional de Organizaciones Regionales Campesinas Autónomas; REDD = reduced emissions from deforestation and degradation.

	International Actors	Mexican Federal State	Rural Social Movements
PHASE 1	2000 2001	Strategic Forestry Plan 2025 calls for PES program <i>Finnish govt. & IADB</i> <i>SEMARNAT</i>	
	2002	PES pilot program designed <i>Economists from World Bank & UC Berkeley</i>	MECNAM coalition <i>12 rural organizations plus leftist political parties</i>
	2003	PSA-H program implemented <i>National Forestry Commission (CONAFOR) with INE design team</i>	Agreement with the Countryside (ANC) promises new PES program <i>Executive branch to MECNAM</i>
PHASE 2	2004 2005	PSA-CABSA program implemented <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 <i>World Bank & GEF</i>
2007		MECNAM reps. removed from PSA-CABSA committee <i>CONAFOR to MECNAM</i>	
2008		Funding for PES quadrupled <i>Executive branch to CONAFOR</i>	
	World Bank Forest Carbon Fund grant to develop national REDD protocol <i>World Bank</i> <i>CONAFOR</i>		

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 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, but over the objections of World Bank advisors, project criteria have been retained that violate

market-efficiency principles, prioritize the poor, and recognize the coproduction of ES by people and nature.

Phase 1: PSA-H

The PSA-H program was initially framed by conservation priorities and market discourse. Forested parcels 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. As these market-efficiency ideals encountered Mexican federal politics and norms, however, PSA-H incorporated central roles for state agencies and its criteria for which sites were to be eligible for 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 among the Mexican Secretariat for Environment and Natural Resources (SEMARNAT), the Inter-American Development Bank, 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 earlier. 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 no decision-making power (Muñoz Piña et al. 2006). Responsibility for implementing the national PES program was eventually assigned to CONAFOR.

Neoliberal analysts see PES as one means of decentralizing environmental management and reducing state control of resources (World Bank 2007). A history of federal control of natural resources still shapes Mexican political culture, however, 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 when 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" (personal interview, 9 March 2006).

Mexican State Resistance to Market-Based ES Management. PSA-H 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 a 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 2003). 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, noncompetitive "market" with the federal government as the sole ES buyer but expected that direct contracts would 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 "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 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 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 did concede to slightly higher payments for cloud-forest parcels: Consulting ecologists had deemed them most important for water provision. CONAFOR made two other, market-oriented concessions. PSA-H would be limited to sites where demand for hydrological services was expected to be high: in watersheds classified as overexploited and in sites 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 had concluded that payments to individuals would be more efficient (Alix-Garcia, de Janvry, and Sadoulet 2006). CONAFOR, however, 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 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.⁸ This stipulation was not adopted. Another antipoverty 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.

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 eligi-

ble 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. Payment rates were based on calculations 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.⁹ 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, challenged by social-movement activists, 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 activists advocating on behalf of *campesino* 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 PES administration.

The coalition of social movements mentioned earlier, MECNAM, had been formed in 2002 with the goal of reversing the damage caused by trade liberalization and the rollback of federal programs that had supported smallholder production. The core of the coalition was made up of twelve independent rural organizations representing multiple economic sectors and regions.¹⁰ 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 *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 members pushed to include managed ecosystems as PES-eligible, to raise per-hectare ES payments, to channel more funds to low-income communities, and to restrict the number of private landholder beneficiaries (Marielle and Aguilar 2003).

It was primarily coffee-grower associations in MECNAM that 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 hit hard 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 cofounder of a state-level association of coffee cooperatives explained, "We were looking for anything we could do to keep coffee farmers from cutting down their plantations. We needed the subsidy from PES" (personal 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 from CONAFOR a design committee for a new PES program was formed that included six representatives from MECNAM groups and officials from CONAFOR, the INE design team, and two government ministries.¹¹ The Ministry of Finance allocated US\$9 million from the PSA-H budget to fund a second PES program. Formation of the new program was a contentious process: More than thirty meetings were held before the rules of operation for PSA-CABSA were finalized. Defining the new program was made more difficult by the fact that actors in the process adhered to different versions of the contrasting PES paradigms described earlier. Moreover, opinions varied and conflicts arose within the social movements, state agencies, and other institutions involved.

Social-Movement Activists Contest Market-Driven PES. The MECNAM representatives brought to the

negotiations for a new program 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 earlier, CES, they saw the PES program as an opportunity to institutionalize recognition of the environmental value of campesino stewardship and to obtain economic aid to enable peasants to remain on the land. One of the MECNAM members on the 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" (personal 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. Without claiming that local land management practices are always ideal, MECNAM representatives depicted campesinos as knowledgeable stewards whose interventions are 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 such activities as removal of pest-ridden or diseased trees, construction of fire breaks, fencing against livestock intrusion, and patrolling 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 (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" (personal interview, 16 June 2006). UNORCA, whose constituents are mainly small-scale grain producers,

Table 1. Payment rates and schedule under the 2004 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

Project development (one year)	Up to US\$36,000: 60 percent up front, 40 percent after annual project verification
Project execution (five years)	Will be made in five annual payments
Carbon sequestration	US\$45/ton CO ₂ e + US\$0.11/unit of social or environmental benefit
Biodiversity conservation	Up to US\$45,000/project/year, including costs of technical assistance
Conversion to agroforestry	Up to US\$90/ha/year
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	Five annual payments: 60 percent up front, 40 percent after verification
Verification of ecosystem services produced	Up to US\$13,500/year
Training of extensionists	Up to US\$13,500/year
Technical assistance	Up to US\$22,500/year; more for biodiversity conservation projects

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. Inclusion of agro-ecosystems producing multiple services conflicted with its and the INE team's 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 because these lands are by law communally held, whereas 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 program did not have a great impact on the communities where it was implemented because there was no requirement that they actively manage the forest, only that they not touch it" (personal inter-

view with a MECNAM member, 16 June 2006). PSA-CABSA, they argued, should require that payments be used for productive activities of long-term, local benefit, such as employment generation, infrastructure improvement, training in the marketing of ES, and ecosystem management and monitoring. CONAFOR agreed to let communities apply for separate funding to train local extensionists. Along with requiring and funding active management, this provision moved CABSA further toward a more multifaceted conception of poverty alleviation.

MECNAM representatives preferred that the federal government continue to regulate and finance the PES contracts. They believed that if payments were generated from private sources, industry "would dictate what management must be done," whereas the government was more likely to allow local management autonomy (personal interview, 29 June 2006). They claimed that decisions based on local knowledge about ecosystems, 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, although it 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. Although PSA-CABSA has been criticized as overly complex and difficult to monitor, the PSA-CABSA policies (Table 1) were arguably more conducive than PSA-H to environmental restoration linked to local livelihoods and well-being.

Table 2. Participation, funding, and land area for PSA-H and PSA-CABSA, 2003–2008

Year	No. of participants ^a			Total funding allocated (US\$) ^b			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 ^c	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

Note: PSA-H = Payment for Ecosystem Services–Hydrological; PSA-CABSA = 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.

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

^bFunding is intended to cover all annual payments for that year’s cohort of participants for the full five 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.

^cIn 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 versus other ecosystem services.

Following the first round of implementation of PSA-CABSA, MECNAM participation in program oversight was challenged and program funding was reduced by half every year from 2004 to 2006 (Table 2). CONAFOR attributed these cuts in part to low enrollment rates. From its inception, however, PSA-CABSA had received little promotion or financial backing from CONAFOR. One MECNAM-affiliated NGO representative interpreted successive 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” (personal interview, 29 June 2006). In the third CABSA year, CONAFOR also removed introduction of agroforestry as a PES-eligible activity, but 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, and markets for sustainably produced coffee provided evidence that these systems produce ES with recognizable monetary values.

Fractured by internal disagreements and external pressures, MECNAM was functionally disbanded a year after its formation; other social movement coalitions opposing neoliberal policies have since arisen. 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” (personal 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 the PROÁRBOL program. The specific PES program 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, 5). The Mexican World Bank office incorporated some 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. A 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” (personal interview, 29 June 2007). The

director of PES programs for CONAFOR said of the PSA-CABSA design negotiations, “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” (personal interview, 17 November 2006). He affirmed that he now recognized the importance of intermediary NGOs along with community technical assistance and monitoring because “You can’t just give out the money and expect that it will cause conservation.” These changes in officials’ understandings also played a role in CONAFOR’s resistance to World Bank pressure to reintroduce market-efficiency priorities to the PES programs in 2007.

Even as the direct role of MECNAM waned, innovations that these activists had introduced in PSA-CABSA were integrated 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 to 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 2). New World Bank and GEF financing brought renewed pressures to prioritize market-based conservation efficiency. Despite this, negotiations between the World Bank and the Mexican state resulted in a PES program that retains some characteristics introduced by social-movement activists. Moreover, interest and fi-

nancial 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 for the development of ES markets. Launched in October 2007, the new phase was 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 fourfold since his election (Table 2). PES market efficiency rhetoric fit Calderón’s neoliberal leanings, and the program’s conservation objectives are useful for demonstrating Mexico’s environmentalism to international conservationists. In his public addresses in Mexico, however, Calderón has emphasized the poverty alleviation dimension of PES, repeating that, “We are helping the poorest populations of Mexico and, at the same time, protecting the forest” (Calderón 2008).

World Bank advisors 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 targeting of ES payments to the poor: “Environmental service programs are not specifically designed to be poverty reduction programs” (World Bank 2006, 13). Targeting aimed at poverty reduction “risks undermining (the) primary objective of generating valuable ecosystem services” (13).

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” (World Bank 2006, 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 graduated by predicted risk of deforestation and by opportunity costs, but 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" (personal interview, 3 October 2007).

During this period, World Bank advisors 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. Apparent trends in Mexico do not favor linkage of productive and conservation activities, however. A recent report on Mexico's forest sector found that the few CONAFOR programs supporting integrated development of community forest management and productive activities were relatively underfunded and were directly competing with the higher payments and less stringent regulations of the PES and reforestation programs (Merino Pérez et al. 2008).

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-sequestration 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 its 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). In his push to make Mexico a leader in the production of carbon offsets, however, Calderón has denounced private-sector carbon markets, strongly advocating the development of an international Green Fund supported by industrialized nations (Stevenson 2009).

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, ES sellers, and 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.

Advocates of market-based environmentalism contend that ongoing 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 objective: They assert that governments must subsidize and monitor ES markets and that PES accountability must not be left to private actors. These contrasting PES paradigms are linked to differing understandings of the role of states, the ability of markets to produce optimal outcomes, and the significance of rural life and agriculture in ecologically sustainable development. They reflect divergent assumptions about human motives and practices with regard to nature and whether the productive use of "natural" landscapes is inimical to conservation.

The designers of Mexico's initial national PES program saw it as a means of increasing conservation efficiency by decentralizing and privatizing 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 banks, and extension of state-funded PES contracts in the absence of established markets. Financial support from the president's office has enabled 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 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 attempted to reshape the PES 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 concerned whether these programs could generate a new category of value for the functions of ecosystems and, if so, who would measure and 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 straits, 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 ES and how they are produced. In challenging the designer’s original emphasis on market development, they also reinforced continued state control of the PES programs.

Other Mexican activists, indigenous spokespeople, and intellectuals denounced the national PES program from the start. These actors view engagement with a neoliberal-inspired policy, even to try to remake it as a rural development program, as a dangerous game. Like past promises of profits from tropical export crops, they contend, the prospect of ES payments might tempt campesinos 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. Some Mexican communities and NGOs continue their efforts to remold PES to support peasant survival and forest conservation in productive rural landscapes. Critics of overly simple, debilitating depictions of the exploitative nature and omnipresence of market relations have pointed out that capitalist agendas can be coopted and transformed in multiple ways by knowledge and action “from below” (Gibson-Graham 2006).

In themselves, however, PES schemes such as Mexico’s 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 advisors 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.” Actual society, with its place-specific complexities and unruly actors, is set aside. The historically contingent, 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; Martínez 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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Notes

1. "Environmental services" and "ecosystem services" are both used in policy discourse. We use ecosystem services because "environmental" services has a second meaning: services such as toxic waste cleanup, emissions-reduction technologies, or environmental impact assessments.
2. This article does not address obstacles to commodification posed by the characteristics and agency of nonhuman nature noted by geographers, although that, too, is a factor in Mexican PES.
3. This article focuses on tensions between neoliberal PES and the Mexican state and social movements. For more information on program implementation and interaction with local level actors, see Shapiro (2007).
4. The consequences of this approach, which depends on continuing North-South and urban-rural inequalities, is explored in McAfee (2009).
5. During the period from 2003 to 2008, the exchange rate was relative steady. We use the approximate average exchange rate of 0.09 Mexican pesos/U.S. dollars.
6. *Nucleo agrario* is an inclusive term for a variety of common property tenure systems codified by the Mexican state, including *ejidos* (peasant associations) and *comunidades* (indigenous communities with tenure that has historical precedence).
7. 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 the Zapatista movement, which seized power in parts of Chiapas in January 1994 and continues to govern "autonomous zones" in parts of that state.
8. Degree of marginalization is calculated at the municipal level by the Mexican federal bureau of statistics (INEGI) based on socioeconomic indicators including income.
9. The national minimum wage at the time was US\$9/day (MX\$101.22).
10. Other organizations that rallied behind MECNAM included the El Barzón credit-reform movement, corporatist rural organizations (Congreso Agrario Permanente and Confederación Nacional Campesina), and leftist political parties (Partido Revolución Democrática, and Partido del Trabajo; Rubio 2007).
11. The new committee included representatives from CONAFOR, INE, SEMARNAT, the National Water Commission (CNA), two coffee producer associations (the National Coordinating Committee of Coffee Producer Organizations [CNOC] and the State Coordinating Committee of Organic Coffee Producers of Oaxaca [CEPCO]), two community forestry organizations (the Mexican Network of Peasant Forestry Organizations [Red-MOCAF] and the National Union of Community Forestry Organizations [UNOFOC]), a coalition implementing PES in Oaxaca (the Environmental Services of Oaxaca [SAO]), and UNORCA.

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