LEGAL FRAMEWORKS FOR PAYMENTS FOR ECOSYSTEM SERVICES: Comparative Policy Approaches to Establishing, Regulating and Enabling Payments to Conserve Ecosystems

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Abstract

Payments for Ecosystem Services (PES) have emerged as a prevalent tool for watershed conservation where the condition of upstream ecosystems affects downstream water users. PES schemes operate in different country contexts with varying degrees of government intervention through PES-specific legislation and policy. This article examines examples of legal frameworks for PES in Costa Rica, Ecuador, Colombia, Peru, the United States and the United Kingdom. Three broad categories of legal frameworks can be differentiated: i) 'Establishing' legal frameworks that create state-run PES schemes; ii) 'Regulating' legal frameworks for decentralized PES; and iii) 'Enabling' legal frameworks that stimulate PES without a PES-specific law. These examples demonstrate that PES in practice is not best described as a market-alternative to government regulation, but rather as a tool that is deeply integrated with legal and regulatory frameworks and used to achieve public policy goals.

Introduction

The ecosystem services concept recognizes that healthy ecosystems form irreplaceable natural infrastructure on which human health, economies, and cultures depend.[1] This concept has become a core feature of twenty-first century environmental policy[2] and a

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[1] The Economics of Ecosystems and Biodiversity (TEEB), Mainstreaming the Economics of Nature: A Synthesis of the Approach, Conclusions and Recommendations of TEEB (Earthscan, 2010); Millennium Ecosystem Assessment, Ecosystems and Human Well-Being: Current State and Trends (Island Press, 2010) 49; GC Daily (ed), Nature's Services: Societal Dependence on Natural Ecosystems (Island Press, 1997).

[2] E Gomez-Baggethun and others, 'The history of ecosystem services in economic theory and practice: From early notions to markets and payment schemes' (2010) 69 Ecological Economics 1209; JB Ruhl and J Salzman, 'The Law and Policy Beginnings of Ecosystem Services' (2007) 22(2) Journal of Land Use 157.

dominant influence in water management.[3] An ecosystem services approach emphasizes the need to better account for the full value of ecosystems in decision-making, including the design of economic instruments to represent the value of ecosystem services in the economy.[4]

Payments for Ecosystem Services (PES) is a term used to describe a range of resource-management tools that create positive incentives for the conservation of ecosystems, with the aim of securing ecosystem services such as provision of fresh water, carbon storage, maintenance of biodiversity and recreation.[5] The scope of programmes identified under the PES umbrella is broad,[6] with PES appearing to have 'become a catch phrase… [for] virtually all financial and legal incentive mechanisms for promoting conservation and good environmental citizenship'.[7] PES are especially prevalent as a tool for watershed conservation where the condition of upstream ecosystems affects downstream water users.[8] There are over 406 payments for watershed services programmes worldwide, with examples on every continent and in 29 countries.[9] These schemes have collectively supported the protection or rehabilitation of 365 million hectares of ecosystems critical to water services.[10] PES schemes have emerged in the context of a wide range of different legal frameworks, with varying degrees of government intervention through PES-specific legislation and policy.

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[3] BR Cook and CJ Spray, 'Ecosystem services and integrated water resource management: Different paths to the same end?' (2012) 109 Journal of Environmental Management 93.

[4] Cf TEEB above (n. 1).

[5] MM Sommerville, JP Jones and EJ Milner-Gulland, 'A revised conceptual framework for payments for environmental services' (2009) 14(2) Ecology and Society 34.

[6] S Wunder 'Revisiting the concept of payments for environmental services' (2015) 117 Ecological Economics 234.

[7] Cf Greiber, below (n. 27).

[8] M Smith and others, Pay - Establishing payments for watershed services (IUCN 2006); I Bond and J Mayers, *Fair deals for watershed services: Lessons from a multi-country action-learning project* (International Institute for Environment and Development, 2010); D Southgate and S Wunder, 'Paying for watershed services in Latin America: a review of current initiatives' (2009) 28(3) Journal of Sustainable Forestry 497; I Porras, B Alyward, and J Dengel, *Monitoring payments for watershed services schemes in developing countries* (International Institute for Environment and Development, 2013).

[9] G Bennett and N Carroll (eds), *Gaining Depth: State of Watershed Investment 2014* (Forest Trends, 2014).

[10] Ibid.

This article will examine the role of law in PES, with particular reference to water management. It will first provide a brief overview of the ecosystem services concept and the emergence of payments for ecosystem services. It will then present three broad categories of legal frameworks, differentiated in terms of their primary function with respect to PES:

(i) 'Establishing' legal frameworks that create state-run PES schemes;
(ii) 'Regulating' legal frameworks for decentralized PES;
(iii) 'Enabling' legal frameworks that stimulate PES without a PES-specific law.

Examples in the first category are most numerous and include Costa Rica and Ecuador. The second category includes recent laws introduced in Colombia and Peru and examples from the United States and the United Kingdom illustrate the third category. Analysis of these examples will demonstrate the different ways law can influence the development, design and implementation of PES.

I. Ecosystem Services and Payments for Ecosystem Services as an Emerging Environmental Policy Tool

Ecosystem services can be defined simply as 'the benefits people obtain from ecosystems'[11], or 'the many natural processes by which ecosystems, and the species that make them up, sustain and fulfill human life'[12]. Human understanding of ecosystem services can be traced as far back as civilization[13], but the concept has been applied to environmental policy more recently in the context of competing demands on increasingly depleted ecosystems. The Millennium Ecosystem Assessment (MEA) in 2005 was a defining work in the progression of the ecosystem services concept in international environmental policy. It categorized ecosystem services in four layers:[14]

(i) 'Provisioning services' such as food, fuel, timber and fresh water;
(ii) 'Regulating services' such as water filtration, flow regulation and flood mitigation by natural landscapes, carbon storage by forests and pollination of crops by insects;
(iii) 'Cultural services' that encompass aesthetic, spiritual and recreational values of nature; and

[11] Cf Millennium Ecosystem Assessment above (n. 1).

[12] Cf Daily above (n. 1).

[13] HA Mooney and PR Ehrlich, 'Ecosystem Services: a fragmentary history' in GC Daily (ed), *Nature's Services: Societal Dependence on Natural Ecosystems* (Island Press, 1997).

[14] Cf Millennium Ecosystem Assessment above (n. 1).

(iv) 'Supporting services', those fundamental ecosystem processes on which all other services depend, such as soil formation, photosynthesis, the water cycle and biodiversity.

The MEA found that 60 percent of the ecosystem services examined were being degraded or used unsustainably, posing a significant barrier to sustainable development goals.[15] With respect to water resources, failure to protect watersheds and dependence on large-scale built infrastructure compromises the ecosystem services that underpin water security, with negative impacts on water quality, quantity and timing of flows.[16] The critical role of ecosystems has been inadequately represented in legal, economic and governance institutions.[17] The value of most ecosystem services is not accounted for in the market, and in this way ecosystem services can be understood as 'externalities' in economic theory.[18] An ecosystem services approach attempts to broaden the lens of analysis to consider the value of ecosystems in their natural state and illuminates the full impact of trade-offs between alternate uses.[19] The Economics of Ecosystems and Biodiversity (TEEB) initiative has led research on strategies to shift economic incentives in favour of ecosystem protection.[20] Equipped with emerging knowledge about ecosystem service values, the policy challenge is then to design interventions to capture, or 'internalize', those values in decision-making.[21]

Policy interventions may include a range of tools, which in most cases are not fundamentally novel, but involve reforming existing laws, policies and economic instruments to target ecosystem services. Knowledge about ecosystem services can inform sustainable development planning[22] and new approaches to macroeconomic policy in the reform of

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[15] Ibid.

[16] H Cooley and others, 'Chapter 1: Global Water Governance in the Twenty-First Century' in PH Gleick and others (eds), *The World's Water (Volume 8): The Biennial Report on Freshwater Resources* (Island Press 2014); D Russi and others, *The Economics of Ecosystems and Biodiversity for Water and Wetlands* (Institute for European Environmental Policy & Ramsar Secretariat, 2013); cf Millennium Ecosystem Assessment above (n. 1).

[17] JB Ruhl, SE Kraft and CL Lant, *Law and Policy of Ecosystem Services* (Island Press 2007); GC Daily and others, 'Ecosystem services in decision-making: time to deliver' (2009) 7(1) Frontiers in Ecology and the Environment 21; cf TEEB above (n. 1).

[18] Ibid.

[19] RS de Groot, 'Environmental functions as a unifying concept for ecology and economics' (1987) 7(2) *The Environmentalist* 105; cf Gomez-Baggethun (n. 2); cf Daily and others above (n. 17).

[20] Cf TEEB above (n. 1).

[21] Ibid.

[22] P ten Brink and others, *Nature and its Role in the Transition to a Green Economy* (The Economics of Ecosystems and Biodiversity, 2012).

subsidy and tax schemes.[23] In this context, PES are attracting interest as mechanisms to translate external, non-market values of ecosystem services into financial incentives.[24] Successful PES programs are demonstrating that it is more cost-effective to invest in protecting forests and wetlands to naturally filter out pollutants, regulate river flows, recharge groundwater, and absorb flooding, compared to the cost of building storm walls and treatment plants.[25] The creation of economic incentives can also be effective where traditional regulations are challenging to enforce.[26] Increasingly, PES schemes are expected to complement command-and-control measures.[27]

There remain active debates about PES definitions, ideal PES design and how to distinguish PES from other economic instruments in environmental policy.[28] The 'Wunder definition' proposed in 2005[29] remains the most commonly cited, and was recently revised. Wunder's revised definition assigns five criteria to PES:[30]

(i) voluntary transactions;
(ii) between service users;
(iii) and service providers;
(iv) that are conditional on agreed rules of natural resource management;
(v) for generating offsite services.

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[23] Cf TEEB above (n. 1).

[24] S Engel, S Pagiola and S Wunder 'Designing payments for environmental services in theory and practice: An overview of the issues' (2008) 65 Ecological Economics 663.

[25] Cf Bennett and Carroll above (n. 9).

[26] Cf TEEB (n1).

[27] T Greiber (ed), Payments for Ecosystem Services: Legal and Institutional Frameworks (IUCN, 2009) 3.

[28] Cf Wunder (n 6); R Muradian and others, 'Reconciling theory and practice: an alternative conceptual framework for understanding payments for environmental services' (2010) 69(6) Ecological Economics 1202; L Tacconi, 'Redefining payments for environmental services' (2012) 73(1) Ecological Economics 29; J Farley and R Costanza, 'Payments for ecosystem services: from local to global' (2010) 69(11) Ecological Economics 2060; BK Jack, C Kousky and KRE Sims, 'Designing payments for ecosystem services: lessons from previous experience with incentive-based mechanisms' (2008) 105 (28) PNAS 9465; R Pirard and R Lapeyre, 'Classifying market-based instruments for ecosystem services: A guide to the literature jungle' (2014) 9 Ecosystem Services 106.

[29] S Wunder, 'Payments for environmental services: some nuts and bolts' (2005) CIFOR Occasional Paper #42.

[30] Cf Wunder above (n. 6) at 8.

This definition is meant to provide a model for comparative purposes, rather than a strict method for categorizing what are and are not PES.[31] In practice, 'service providers' vary, but are usually landowners who are in a position to affect the condition of the ecosystems on their land.[32] 'Service users' may or may not be directly involved in transactions, and in most cases are represented by government agencies paying for ecosystem services on behalf of the public. Where such agencies are mandated to implement PES and funding comes from mandatory taxes or levies, the voluntariness in criteria (1) will not be satisfied on the part of 'service users'.[33] As reflected in criteria (4), PES do not necessarily entail the trade of ecosystem services per se. Rather, often payments are made in exchange for some human activity on the part of 'service providers' that can be linked to resulting ecosystem services. Another feature of ideal PES are the outcome of 'additionality'; the payment should provide some additional environmental outcome above the status quo that would not be achieved if not for the payment.[34] In this way, PES should not be a substitute for the 'polluter pays principle' whereby polluters should bear the cost of compliance with regulatory obligations.[35]

The conceptual ideal of PES in economic theory is presented as a direct negotiation between 'users' and 'providers' to create a market that optimizes economic efficiency for the provision of ecosystem services.[36] This PES ideal has been criticized as a neoliberal approach that depends on the commodification of ecosystem services within a free market, which has not been achieved in practice and which is inconsistent with the natural features of ecosystems.[37] Furthermore, descriptions of PES based on economic theory have been criticized for 'not pay[ing] enough attention to the role of institutions and shared beliefs in

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[31] Cf Wunder above (n. 6); cf Engel, Pagiola and Wunder above (n. 24).

[32] Cf Engel, Pagiola and Wunder above (n. 24).

[33] A Vatn, 'An institutional analysis of payments for environmental services' (2010) 69 Ecological Economics 1245; S Schomers and B Matzdorf, 'Payments for ecosystem services A review and comparison of developing and industrialized countries' (2013) 6 Ecosystem Services 16.

[34] JE Salzman, *A Policy Maker's Guide to Designing Payments for Ecosystem Services* (Asian Development Bank, 2009); cf Engel, Pagiola and Wunder (n. 24); *Payments for Ecosystem Services Getting Started: A Primer,* (Forest Trends, The Katoomba Group and UNEP, 2008).

[35] U.K. Department for Environment, Food and Rural Affairs (DEFRA), *Developing the potential for Payments for Ecosystem Services: an Action Plan* (DEFRA, May 2013).

[36] Cf Wunder above (n. 29).

[37] SZ Shamer, *The Outcomes of Translating Neoliberal Environmental Theory: A Critical Analysis of Payments for Ecosystem Services* (Thesis submitted to the Faculty of the Graduate School of the University of Maryland, in partial fulfillment of the requirements for the degree of Masters of Science, 2014); D Goble, 'What are Slugs Good for? Ecosystem Services and the Conservation of Biodiversity' (2007) 22(2) Journal of Land Use 411.

shaping PES design and outcomes, even if these are critical under 'non-perfect' market situations'.[38] PES are not merely about financial incentives and 'should be understood as part of a broader process of local institutional transformation, rather than a market-based alternative for allegedly ineffective government'.[39] These are central issues in evaluating the role of law with respect to PES. The examples below will demonstrate how legal frameworks shape PES development, design and implementation, and link PES to broader institutions and policies for resource management.

In most cases PES have developed in the absence of an overarching PES-specific law.[40] Private PES arrangements between two parties require no legal preconditions beyond basic contract law and the absence of any legal provisions that prohibit PES schemes.[41] The contractual arrangements for individual PES agreements are the most direct basis of PES in law and the specific terms of PES contracts will most significantly influence the obligations of the parties and the outcome for ecosystem services.[42] Broader legal frameworks and government intervention through legislation and policy can also influence the development and implementation of PES in important ways.

PES participants suggest that a lack of supportive policy frameworks in many countries is a major barrier[43] and scaling up positive results of existing PES schemes may require a specific policy and legal framework.[44] Legal intervention in PES can also provide certainty and clarity for PES participants, encouraging participation.[45] Furthermore, it has been argued that markets can only encourage more efficient allocation of environmental resources if sound environmental policy and institutional frameworks are in place; in the absence of appropriate frameworks, market and policy failures are amplified and intensify environmental pressures.[46] In designing legal frameworks for PES, these considerations should be balanced against the potential downside of PES law creating increased bureaucracy and increasing transaction costs for PES.[47] The examples below demonstrate different levels of government intervention in PES, ranging from laws that define nearly

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[38] cf Cf Muradian and others above (n. 28), 1205.

[39] G Van Hecken and J Bastiaensen, 'Payments for ecosystem services in Nicaragua: do market-based approaches work?' (2010) 41 Development and Change 421, 421.

[40] Cf Greiber above (n. 27).

[41] Ibid.

[42] Cf Engel, Pagiola and Wunder above (n. 24); cf Greiber above (n. 27).

[43] Cf Bennett and Carol above (n. 9).

[44] Cf Greiber above (n. 27).

[45] Ibid.

[46] OECD Environmental Outlook to 2030 (OECD, 2008).

[47] Cf Greiber above (n. 27).

every aspect of state-run PES, to laws that regulate PES that are implemented at a local level, to legal frameworks that enable PES uptake without specifically mandating PES.

II. Law Establishing State-Run Payments for Ecosystem Services

In the spectrum of schemes under the PES umbrella, those with highest degree of government intervention are state-run PES programmes, which are created and operated by the government. The legal framework establishes the scheme itself and determines the ecosystem services targeted and who is eligible to participate. Generally, a centralized fund is established and a designated government agency is mandated to allocate payments according to prescribed criteria. Payments are typically conditional on land management activities such as retention of natural forests, ecosystem restoration, or sustainable agricultural practices. State-run PES schemes are often described as 'public' PES, distinguished from private or market-based PES where buyers and sellers of ecosystem services negotiate directly.[48] It can be understood as a type of subsidy used in macroeconomic policy to encourage positive externalities.[49]

Examples of state-run PES schemes can be found across different regions and in both developed and developing countries.[50] United States' federal agriculture policy dating back to the 1930's[51] and agri-environmental programs under European Union policy since the 1970s are characteristic of state-run PES by providing payments to farmers for voluntary conservation efforts.[52] China has a suite of multi-billion dollar national PES programs.[53] National PES schemes are particularly prevalent in Latin America, beginning with the introduction of Costa Rica's PES programme in 1997.[54] Mexico drew on the Costa Rican model in establishing a national programme 2003.[55] Another example is *Bolsa Florestal* in

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[48] Cf Vatn above (n. 33); cf Engel, Pagiola and Wunder above (n. 24); cf Greiber above (n. 27).

[49] Ibid.

[50] Cf Schomers and Matzdorf above (n. 33).

[51] Ibid.

[52] Ibid.

[53] Cf Schomers (n 33); J Qiu, R Liu, J Zhao and H Deng, 'Establishing eco-compensation mechanism in Bohai Sea waters under framework of ecosystem approach' (2008) 18 China Population, Resources and Environment 60; Y Xiong and KL Wang, 'Eco-compensation effects of the wetland recovery in Dongting Lake area' (2010) 20 Journal of Geographical Sciences 389.

[54] T Herbert and others, Environmental Funds and Payments for Ecosystem Services: RedLAC Capacity Building Project for Environmental Funds (RedLAC, 2010).

[55] Mexico began with PES to protect hydrological services, which has now expanded to encompass carbon and biodiversity services under the umbrella programme *ProArbol*: 'ProArbol' (*The REDD Desk*) <www.theredddesk.org/countries/initiatives/proarbol> accessed 1 October 2015.

Brazil's Amazonas State, which remunerates traditional communities and families for conservation and sustainable development activities.[56] Ecuador's *Proyecto Socio Bosque* has provided conservation incentives to rural landowners since 2008,[57] and influenced the development of a similar programme in Bolivia.[58] The Costa Rican and Ecuadorian examples are discussed in more detail below.

A. Costa Rica's Payments for Ecosystem Services Programme

Costa Rica's Payment for Environmental Services Programme (*Programa de Pago de Servicios Ambientales,* PPSA) is one of the most studied examples in the PES literature, and is internationally regarded as a success.[59] The PPSA was legally established via amendments to the national Forestry Law[60] in 1997 with the objective of reducing deforestation. It seeks to replace the traditional concepts of 'subsidies' and 'incentives' with 'economic recognition for ecosystem services',[61] and is implemented in furtherance of constitutional rights to a healthy and ecologically balanced environment.[62]

The Forestry Law established the National Forest Finance Fund *(Fondo Nacional de Financiamento Forestal*, FONAFIFO), as a semi-autonomous agency to manage the PPSA with oversight from the Ministry of Environment and Energy (*Ministro de Ambiente y Energía*, MINAE).[63] FONAFIFO enters into standardized contracts with landowners for four ecosystem services identified in the law: (i) carbon fixation, capture and storage; (ii)

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[56] 'Bolsa Floresta Program' (Amazonas Sustainable Foundation*)* <www.fas-amazonas.org/programa-bolsa-floresta/?lang=en> accessed 1 October 2015.

[57] 'Socio Bosque: Programma de proteccion de bosques [Socio Bosque: Forest Protection Programme]' (Ministerio del Ambiente, Gobierno Nacional de la Republica de Ecuador) <www.sociobosque.ambiente.gob.ec> accessed 4 October 2015.

[58] 'Socio Bosque comparte experiencias con delegación boliviana [Socio Bosque Shares Experiences with Bolivian Delegation]' (Gobierno Nacional de la Republica de Ecuador) <www.sociobosque.ambiente.gob.ec/node/690> accessed 4 October 2015.

[59] K Bennett and N Henninger, *Payments for Ecosystem Services in Costa Rica and Forest Law No. 7575: Key Lessons for Legislators* (World Resources Institute, 2009); I Porras and others, Learning from 20 Years of Payments for Ecosystem Services in Costa Rica (International Institute for Environment and Development, 2013).

[60] Law 7575 of 1996.

[61] 'Pago de Servicios Ambientales [Payments for Ecosystem Services]' (FONAFIFO, Ministerio de Ambiente y Energia, Gobierno de Costa Rica) <www.fonafifo.go.cr/psa/> accessed October 25 2015.

[62] Constitution of the Republic of Costa Rica, Art. 50.

[63] MINAE Executive Decree 30762 of 2002 designates FONAFIFO sole responsibility for managing the PPSA; prior to this management was shared with the National System of Conservation Areas.

protection of water for urban, rural or hydroelectric use; (iii) biodiversity conservation; and (iv) scenic natural beauty.[64]

The PPSA is voluntary and accessible to any private landowner with property title or possession rights, with a minimum land area of one hectare.[65] Payment levels and contract terms vary (between 5 and 15 years) depending on different categories of conservation activities.[66] For example, incentives in 2015 were set at US$ 398 per hectare per year for a five-year term for areas protecting water resources.[67]

An annual decree prioritizes budget allocations to specific categories of PES contracts.[68] For 2015, there were five overarching categories: (i) reforestation; (ii) natural regeneration; (iii) forest protection (with sub-categories, including protection of water resources); (iv) sustainable forest management; and (v) agroforestry.[69] Applications within these categories are further prioritized by a points system based on criteria such as conservation gaps (85 points), biological corridors (80 points), importance to water resources (80 points), and poverty (10 points).[70] Areas of importance to water resources must be selected based on basin plans[71], as identified by the MINAE Water Board,[72] such that the PPSA works cohesively towards broader water management objectives.

In 2001 tax law amendments established that 3.5 percent of the revenues accruing from Costa Rica's fossil fuel tax be allocated to the PPSA.[73] In 2006 water tariffs were increased significantly and 25 percent of revenues were dedicated to the PPSA, to be applied in strategic water catchment areas.[74] The Forestry Law also gives FONAFIFO broad powers to obtain financing from other sources.[75] To encourage private sector investment, FONAFIFO issues Certificates of Ecosystem Services in exchange for the voluntary 'purchase' of ecosystem services via financial contributions to the PPSA, which are promoted mainly on the basis of corporate social responsibility. [76] It is also expected that

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[64] Law 7575 of 1996, Art. 3(k).

[65] MINAE Decree No 39083 of 2015.

[66] Ibid.

[67] Ibid, Art. 4.

[68] For 2015, see MINAE Decree No 39083 of 2015.

[69] Ibid, Art. 1.

[70] Ibid, Art. 4.2.

[71] Ibid, Art. 7.

[72] Ibid, Art. 4.

[73] Law 8114 of 2001.

[74] MINAE Decree 32868 of 2006.

[75] Law 7575 of 1996, Art. 47.

[76] Cf Porras and others above (n. 59).

international funds from the United Nations REDD+ (Reducing Emissions from Deforestation and Forest Degradation) Programme will be channeled to the PPSA.[77]

B. Ecuador's Socio Bosque Programme

Ecuador's *Socio Bosque* (Forest Partners) is a national programme of conservation incentives that explicitly pairs poverty alleviation and ecosystem conservation, based on an ecosystem services framework. It was introduced in 2008 following the adoption of a new constitution setting out comprehensive provisions on environmental protection, including: public rights to a healthy environment[78]; existential rights of nature[79]; obligations of the state to protect natural heritage, including through the creation of financial incentives[80]; and a statement that ecosystem services shall not be subjected to appropriation, their use and delivery being regulated by the state.[81] *Socio Bosque* was established by decree[82] based on these constitutional principles and in accordance with a mandate set out in the National Development Plan 2007-2010.[83]

As the designated authority for *Socio Bosque,* the Ministry of Environment is authorized to enter into contracts with landowners to provide financial incentives for the conservation and protection of forests and páramo[84] ecosystems on their properties.[85] The Ministry of Environment is responsible for determining the level of incentives, the ecosystem services targeted, and the terms and conditions included in standardized contracts.[86] These details are set out in a series of ministerial agreements and consolidated in an operations manual.[87] Payments target three ecosystem services: (i) carbon storage, (ii) water cycle regulation and (iii) habitat for biodiversity.[88]

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[77] GK Rosendal and PJ Schei, 'How may REDD+ Affect the Practical, Legal and Institutional Framework for 'Payment for Ecosystem Services' in Costa Rica?' (2014) 9 Ecosystem Services 75.

[78] Constitution of the Republic of Ecuador, Art. 14.

[79] Ibid, Art. 71.

[80] Ibid, Art. 3.7.

[81] Ibid, Art. 74.

[82] Ministry of Environment Decree 169 of 2008.

[83] National Development Plan, 2007-2010 (National Government of the Republic of Ecuador 2007).

[84] Páramos are high altitude neotropical ecosystems that are particularly important for water resources in Ecuador.

[85] Ministry of Environment Decree 169 of 2008, Art. 3.

[86] Ibid, Art. 5.

[87] Unified Operation Manual, Socio Bosque Project (Ministry of Environment, 2012).

[88] Ibid, Art. 3.1b).

Participation is voluntary for landowners,[89] who must have land title to apply.[90] Payments are conditional not only on conservation of the land, but on commitments by participants to apply financial resources according to an investment plan to advance development goals such as health and education.[91] The term of contracts is 20 years, requiring participants to make a long-term commitment to conservation and demonstrating a long-term vision for the programme. Payment amounts range from US$ 60 per hectare per year for areas less than 20 hectares to US$ 0.70 per hectare per year for areas over 10,000 hectares[92], with higher levels of payments for smaller landholders in line with poverty alleviation goals.

The selection process for applications applies national environmental and social data to create spatial targeting maps identifying priority areas, ensuring *Socio Bosque* is consistent with broader sustainable development planning.[93] Applications are selected from within these mapped areas, and further prioritized based on a formula designed to weigh: (i) the level of threat to the area (from 1 to 6 points); (ii) the importance of the area to providing ecosystem services (from 0 to 9 points) and (iii) level of poverty (from 0 to 3 points).[94]

The majority of funds for *Socio Bosque* come from state resources allocated as part of the Ministry of Environment's annual budget. The Ministry is looking to diversify sources of funding, including: earmarking of new green taxes; fees attached to extractive industry licenses to compensate for impacts; voluntary contributions from corporations, possibly linked to some form of environmental offsetting; international cooperation funds; and REDD+ payments.[95]

III. Law Regulating Decentralized Payments for Ecosystem Services

The introduction of laws to regulate PES is a relatively recent and novel development in environmental law. Peru and Colombia have become leading jurisdictions with the introduction of legislation considered 'groundbreaking' in the PES policy landscape.[96] Under this type of legal framework PES schemes may be operated and funded by various parties

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[89] Ministry of Environment Decree 169 of 2008, Art. 2.

[90] Unified Operation Manual, Socio Bosque Project (Ministry of Environment, 2012) Art. 5.

[91] Ibid, Art. 8.

[92] Ibid, Art. 4.2.1.

[93] F de Koning and others, 'Bridging the gap between forest conservation and poverty alleviation: the Ecuadorian Socio Bosque program' (2011) 14(5) Environmental Science & Policy 531.

[94] *Unified Operation Manual, Socio Bosque Project* (Ministry of Environment, 2012) Art. 3.2 b).

[95] J Fehse, Private conservation agreements support climate action: Ecuador's Socio Bosque programme (Climate and Development Knowledge Network, 2012).

[96] Cf Bennett and Carroll above (n. 9) ix.

but the legislation establishes regulatory oversight of the schemes, including a national registry. The law authorizes and promotes voluntary, decentralized development of PES within regulatory limits, supports monitoring and enforcement, and provides legal certainty for the parties involved. The main objective of government intervention is to ensure coordination and consistency of PES with national strategies and state duties to manage natural resources. The Peruvian law is broadest, establishing national jurisdiction to regulate all PES, while the Colombian law provides national regulatory oversight for municipal PES for watershed protection. These examples are both elaborated on below.

A. Colombia's Legal Framework for PES

Colombia introduced regulations[97] in 2013 to promote and regulate the development of PES to protect municipal water supplies. The law was developed in accordance with a mandate under the National Development Plan 2010-2014,[98] which elaborated on the value of ecosystem services to the country and provided direction on designing strategies to integrate environmental considerations into decision-making. The Plan also refers to the constitutional duty of the state to conserve and protect ecosystems and their diversity, and the rights of the people to a healthy environment.[99]

Colombia's framework for natural resource management is set out in a general environmental law, which designates lead authority to the Ministry of Environment (Ministerio de Ambiente, Vivienda y Desarrollo Territorial - MAVDT), and delegates responsibilities such as watershed management to regional environmental authorities (Corporaciones Autónomas Regionales - CARs). Municipalities and departments are responsible for water provision and sanitation services.[100] The general environmental law requires departments and municipalities to allocate at least 1 percent of their annual income to the conservation of natural areas of strategic importance for municipal water supply.[101] In addition, any project that takes water directly from natural sources (for either human consumption, recreation, irrigation or industrial use), must allocate at least 1 percent of the total investment to the improvement and monitoring of the watershed that feeds the respective water source.[102]

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[97] Ministry of Environment and Sustainable Development Decree 953 of 2013.

[98] National Development Plan 2010-2014 'Prosperity for All', Government of the Republic of Ecuador.

[99] Constitution of the Republic of Colombia, Art. 79.

[100] Law 99 of 1993.

[101] Ibid, Art. 111.

[102] Ibid, Art. 43.

Amendments to this law, introduced in 2011, specifically permit these municipal funds to be applied towards the financing of PES schemes.[103] PES remains voluntary, as the funds may alternately be directed to land acquisition or to other watershed conservation activities. [104] Further to these amendments, regulations were issued in 2013 setting out rules and guidance for PES development, requiring collaboration between local government (municipalities and departments) and CARs, with oversight from MAVDT.[105]

Under the regulations, PES may be applied to protect ecosystem functions that generate hydrological services with benefits to the community, such as water regulation, erosion and sediment control, which must be linked to water resources that supply the municipal, district and regional aqueducts.[106] CARs define areas of strategic importance to water resources based on existing watershed management plans.[107] CARs then provide technical assistance to local governments to identify individual properties based on the criteria enumerated in the regulation, including the ecological quality of the property, the directness of the link between land use and water supplies, and the degree of threat to the area from anthropic pressures.[108]

Local governments approach landowners on targeted properties to negotiate voluntary contracts. The regulations also set- out guidance on: the selection of participants (including priority to those with lower incomes)[109]; the value of the incentive (cash or in-kind, considering opportunity costs)[110]; and contract terms and conditions (a list of issues that a PES contract must address, with a maximum term of 5 years).[111] Local governments must carry out periodic monitoring to verify compliance[112] and must register each contract with the CAR,[113] which submits an annual PES register to MAVDT.[114] MAVDT may provide funding and technical assistance to CARs to coordinate and promote PES.[115]

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[103] Law 1450 of 2011, Art. 210 amending Art. 111 of Law 99 of 1993.

[104] Ibid.

[105] Ministry of Environment and Sustainable Development Decree 953 of 2013.

[106] Ibid, Art. 3.

[107] Ibid, Art. 4.

[108] Ibid, Art. 5.

[109] Ibid, Art. 9.1.

[110] Ibid, Art. 9.2.

[111] Ibid, Art. 9.3.

[112] Ibid, Art. 9.4.

[113] Ibid, Art. 9.5.

[114] Ibid, Art. 14.

[115] Ibid, Art. 9.5, paragraph 4.

B. Peru's Legal Framework to Regulate and Promote PES

Peru introduced its *Payment for Ecosystem Services Law*[116] in 2014, establishing national oversight by the Ministry of Environment (MINAM) over all PES, whether publicly or privately funded. The purpose of the law is to promote, regulate and supervise voluntary PES for the conservation, restoration, and sustainable use of ecosystems to permanently secure the benefits they provide.[117] One of the objectives in developing the law was to encourage privately negotiated PES by providing legal certainty.[118] It is also a strong assertion of national jurisdiction over PES, in line with the powers and responsibilities of the state respecting the environment. The law declares that ecosystem services are part of the national patrimony[119] and that the promotion of public and private investments in ecosystem services is a matter of national interest and within the jurisdiction of the national government to oversee.[120] It also refers to constitutional provisions setting out that renewable and non-renewable natural resources are of the national patrimony,[121] obliging the state to conserve biodiversity and protect natural areas[122] and guaranteeing the rights of the public to a balanced environment.[123]

The law defines ecosystem services as the direct and indirect economic, social and environmental benefits people obtain from the correct functioning of ecosystems, with hydrological regulation of watersheds, maintenance of biodiversity, carbon sequestration, scenic beauty, soil formation, and genetic resources named as examples.[124] The scope of PES regulated under the law is defined broadly, including all schemes, tools, instruments and incentives applied to generate, channel, transfer and invest economic resources, monetary or non-monetary, for the conservation, restoration and sustainable use of the sources of ecosystem services.[125] Payments must be conditional on performance of actions to conserve, recover and sustainably use ecosystem services.[126]

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[116] Law 30215 of 2014.

[117] Ibid, Art. 4.

[118] 'Press release on PES Law' (Ministry of Environment): <www.minam.gob.pe/notas-de-prensa/conoce-como-funciona-la-recien-aprobada-ley-de-servicios-ecosistemicos/> accessed August 5, 2015.

[119] Ibid, Art. 3(b).

[120] Law 30215 of 2014, Supplementary Provisions, Clause 1.

[121] Constitution of the Republic of Peru, Art. 66.

[122] Ibid, Art. 68.

[123] Ibid, Art. 2.

[124] Law 30215 of 2014, Art. 3(b).

[125] Art. 3.

[126] Art. 5.

The law determines who is eligible to receive payments as 'contributors' to ecosystem services: (i) possessors or titleholders of lands; (ii) permit holders for renewable natural resources; (iii) NGOs under management agreements for protected areas; and (iv) others recognized by MINAM.[127] The law is more vague on who the 'beneficiaries' or buyers may be: any public or private, natural or legal person who obtains a benefit and compensates the contributor for the corresponding ecosystem services provided.[128] All public entities are authorized to raise financial resources to dedicate to PES[129] and local and regional governments are specifically permitted to finance PES from their budgets, and to receive and channel donations for PES.[130] This will be important to channeling REDD+ funds to local carbon projects that reduce carbon emissions through avoided deforestation. The law also requires MINAM to provide technical, administrative and financial support to local and regional governments to promote and develop PES.[131] MINAM must also establish a national Registrar, which is responsible for validating PES schemes as agreed between the contributor and beneficiary[132] and for maintaining a publically available register of PES contracts.[133]

At the time the law was passed over 40 PES projects were active in Peru, including both carbon sequestration and water quality and supply projects.[134] In the context of national environmental policy prioritizing water resources, MINAM is currently providing support for further development of PES in watersheds.[135] Also, a new water services law introduced in 2013 includes important provisions giving water utilities a mandate for PES: a new tariff will be dedicated to environmental compensation [136] and environmental compensation mechanisms for watershed management must be included in water utilities' operational plans.[137] Furthermore, in March 2015, MINAM signed an agreement with the national water

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[127] Ibid, Art. 3(d).

[128] Ibid, Art. 3(e).

[129] Ibid, Supplementary Provisions, Clause 3.

[130] Ibid, Art. 13.

[131] Ibid, Art. 12.

[132] Ibid, Art. 10.

[133] Ibid, Art. 9.

[134] Congreso aprobó ley que promueve los esquemas de retribución por servicios ambientales [Congress approves a law to promote PES] (Actualidad Ambiental) <http://www.actualidadambiental.pe/?p=23239> accessed August 5, 2015.

[135] cf Bennett and Carroll above (n. 9).

[136] Law Modernizing Water Services, Law 30045 of 2013, Art. 15.4.

[137] Ibid, Art. 3(b).

utilities regulator (SUNASS), to jointly develop policies and guidelines for PES financed by water tariffs to protect water sources.[138]

IV. Enabling Legal Frameworks with no PES-Specific Law

Legal frameworks can influence the development of PES in important ways without legal reform to regulate PES specifically. Government policy can also support PES without creating a centralized scheme operated by the state. Both the United States and the United Kingdom have been relatively active in the uptake of PES to protect watersheds, especially compared to other developed countries.[139] The legal and policy framework in both these cases creates an enabling environment that stimulates the development of PES. Water quality standards at the federal level in the United States and the Water Framework Directive in Europe have had similar functions as drivers for PES as a potentially cost-effective compliance mechanism.[140] In both cases the legislative framework adopts a results-based approach to compliance, which better enables PES as compared to traditional command-and-control- regulation. Funding support for PES, investment in research and capacity-building, and flexibility in municipal water infrastructure expenditures are also important factors that create an enabling environment for PES, as discussed below.

A. Source Water Protection via PES in the United States

New York City's investment in the conservation of the Catskills watershed is often cited as a leading example of PES.[141] The Catskills and Delaware watersheds provide 90 percent of the drinking water supply to New York City, with historically high water quality. In the 1980s concerns about pollution increased.[142] Around the same time, the federal *Safe Drinking*

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[138] MINAM press release: 'MINAM firma convenio con SUNASS para la implementación de Mecanismos de Retribución por Servicios Ecosistémicos Hidrológicos [MINAM signs agreement to implement PES for water]' March 11, 2015.

[139] Cf Bennett and Carroll above (n. 9).

[140] Cf Bennett and Carroll above (n. 9); A Inman and LED Smith, 'Payments for Ecosystem Services: A Review of Existing Mechanisms with Potential to Support Delivery of the Water Framework Directive Objectives' RELU Project RES-240-25-0018 Briefing Note (Centre for Development, Environment and Policy, 2012).

[141] Cf Salzman above (n. 34); cf Smith above (n. 8); E Mercer, D Cooley and K Hamilton, 'Taking Stock: Payments for Forest Ecosystem Services in the United States' (Forest Trends and US Department of Agriculture, 2011); T Gartner and others (eds), *Natural Infrastructure: Investing in Forested Landscapes for Source Water Protection in the United States* (World Resources Institute, 2013).

[142] Cf Smith above (n. 8).

Water Act [143] was introduced to set stringent standards for the quality of unfiltered water for human consumption. Under the new law a water filtration plant would be required if source water was below a certain quality, which could be avoided by watershed protection.[144] Faced with the challenge of compliance, New York City found that the cost of investing in watersheds to maintain and restore natural filtration was much lower than the cost of a new plant. A new filtration plant would have would have cost US$ 6 to 8 billion to build and would have required a two-fold increase in water bills to finance and operate, while watershed conservation costs US$ 1 to 1.5 billion over 10 years financed by a 9 percent tax increase in water bills and some federal and state grant assistance.[145]

Increased source water quality was achieved via PES contracts negotiated with land users in the watershed to reduce pollution and restore native vegetation. After a comprehensive stakeholder consultation process, a Memorandum of Agreement was signed by sixty towns, ten villages, seven counties and various environmental groups, to implement a number of distinct mechanisms that land users may opt into, tailored to different types of land and land uses. For example, forest landowners with at least 20 hectares of land are entitled to an 80 percent reduction in local property tax if they commit to a 10-year management plan. Farmers who opt in receive direct payments, but only if they enter into 10 to 15-year contracts with U.S. Department of Agriculture to remove environmentally sensitive land from production. The programme is voluntary and administered through the Watershed Agricultural Council.[146]

The Catskills example is not alone, with several other cities in different U.S. states using a PES approach to protect drinking water sources. The following cities all implemented PES schemes similar to New York City's to avoid building expensive new filtration plants: Boston, Massachusetts; Portland, Oregon; Portland, Maine; Seattle, Washington; Syracuse, New York; Auburn, Maine; Santa Fe, New Mexico and Denver, Colorado.[147] There is no specific law or government intervention mandating PES and laws for natural resource management also vary considerably in the different U.S. state jurisdictions. However, there are important features of the law and policy framework at the federal level that have facilitated this uptake of PES.

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[143] 42 U.S. Code § 300f.

[144] Cf Mercer, Cooley and Hamilton above (n. 141).

[145] Cf Smith above (n. 8).

[146] Cf Gartner above (n. 141).

[147] Cf Mercer, Cooley and Hamilton above (n. 141).

In addition to the introduction of results-based water quality standards that created a driver for PES, federal funding grants under the federal *Clean Water Act*[148] provide states with funding to allocate to local diffuse pollution reduction projects. The conditions on these grants are flexible enough to be applied towards PES, and have helped fund several municipal PES programs, including the Catskills example.[149] PES has also flourished in jurisdictions where regulations on water utilities are flexible enough to allow utilities invest in PES for source water protection rather than solely in traditional water treatment strategies.[150] More recently, the federal Environmental Protection Agency released a strategic agenda for green infrastructure[151] committing to funding, regulatory support, and guidance on best practices to encourage natural-infrastructure strategies, which could spur further development of PES.[152]

B. Policy Encouraging Investment in PES in the United Kingdom

PES for watershed conservation has emerged relatively rapidly in the U.K. over the past several years, particularly in England.[153] This is poised to scale-up further due to supportive policy from the U.K. Department for Environment, Food and Rural Affairs (DEFRA) and the Water Services Regulation Authority (OFWAT), the body responsible for the regulation of privatized water service companies in England and Wales.[154]

Historically, OFWAT hesitated to allow water service companies to pay landholders for watershed management, considering this a subversion of the 'polluter pays' principle.[155] This began to change following positive experiences by two utility-led investments in watershed services pilot projects (the 'Sustainable Catchment Management Program' and 'Upstream Thinking') and in 2009 OFWAT approved catchment management plans by more than 100 water companies representing more than US$ 100 million in funding for watershed

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[148] Federal Water Pollution Control Act (the 'Clean Water Act'), 33 U.S.C. §§1251-1387, s. 319.

[149] G Bennett, N Carroll and K Hamilton, *Charting New Waters: State of Watershed Payments 2012* (Forest Trends, 2013).

[150] T Gartner, J Mulligan, R Schmit, and J Gunn (eds) Natural Infrastructure: Investing in Forested Landscapes for Source Water Protection in the United States (World Resources Institute, 2013).

[151] *Green Infrastructure Strategic Agenda 2013* (United States Environmental Protection Agency, 2013).

[152] A Leonardi, 'Chapter 7: Europe' in G Bennett and N Carroll (eds), *Gaining Depth: State of Watershed Investment 2014* (Forest Trends, 2014).

[153] Ibid.

[154] Ibid.

[155] Ibid.

services. Although the majority of companies planned to simply 'investigate' watershed approaches between 2010 and 2015, this is anticipated to lead to PES development.[156]

DEFRA supported 11 PES pilot projects for catchment management between 2011 and 2013 and established an Ecosystem Markets Task Force to develop a plan to expand PES, including a best practice guide on PES design.[157] The resulting *Action Plan* recognizes that the 'Government and its agencies have a role in facilitating stakeholders including the private sector to develop PES'. [158] A relatively low level of government intervention is planned to achieve this, focusing on:

(i) capacity building;
(ii) disseminating best practices;
(iii) demonstrating 'proof of concept' for PES applications through piloting; and
(iv) removing barriers that could enable PES opportunities to develop.[159]

With respect to PES for water quality, DEFRA will also ensure that PES approaches are integrated within a coherent framework for catchment management across England.[160]

Following DEFRA's *Action Plan,* OFWAT began a review of the regulatory framework for water service companies to consider ways to encourage more innovative and sustainable solutions, including PES.[161] DEFRA also issued the *Strategic Policy Statement to* OFWAT in 2013, strongly in favour of investment in reducing pollution upstream rather than extracting pollution downstream.[162] It states the 'Government expects Ofwat's regulatory framework to enable water companies to pursue payments for ecosystems services schemes'.[163]

Broader policy is also less directly involved in supporting PES in the U.K., most significantly the E.U.'s Water Framework Directive (WFD). The WFD requires members of the European Union to meet water quality standards and to engage in integrated river basin management planning, but leaves the choice of specific policy interventions to individual states.[164] PES is viewed by policy-makers as a cost-effective compliance mechanism.[165]

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[156] Ibid.

[157] Payments for Ecosystem Services: A Best Practice Guide (DEFRA, 2013).

[158] Developing the potential for Payments for Ecosystem Services: an Action Plan (DEFRA, 2013) 13.

[159] Ibid.

[160] Ibid, 7.

[161] Developing the potential for Payments for Ecosystem Services: an Action Plan (DEFRA, 2013).

[162] DEFRA's Strategic Policy Statement to OFWAT - Incorporating Social and Environmental Guidance (DEFRA, 2013).

[163] Ibid, s. 3.13.

[164] Cf Bennett, Carroll and Hamilton above (n. 149).

[165] Cf Inman and Smith above (n 140).

European Commission guidance for implementing the WFD also emphasizes economic instruments and natural infrastructure.[166]

Conclusion

Legal frameworks for payments for ecosystem services are diverse and represent various degrees of government intervention in PES. This article has presented three categories of legal frameworks for PES and evaluated examples of each, ranging from laws establishing state-run PES schemes, to laws regulating PES through to enabling legal frameworks. These examples demonstrate that PES in practice is not best described as a market-alternative to government regulation, but rather as a tool that is deeply integrated with legal and regulatory frameworks and used to achieve public policy goals. The role of law can also be understood in terms of the state representing the public interest in ecosystem services, which is in some cases bolstered by constitutional rights and duties.

Legal frameworks can influence the development of PES in different ways. Most directly, the law can create state-run schemes. PES-specific laws can also enable the decentralized development of PES, establish regulatory oversight, and encourage PES uptake by providing legal certainty. Environmental quality standards can drive PES development if they allow flexible options for compliance. Supportive policies can provide guidance and funding for PES programmes' start-up, and law and policy reform can remove barriers to PES. The law can also create dedicated funding sources for PES. Legal frameworks can also affect the design and implementation of PES, in particular to ensure that PES works towards higher-level strategies for ecosystem services. The law can dictate all contract terms and conditions for state-run schemes. PES-specific laws can dictate a process for integrating national, regional and local planning for PES and also require that PES contracts include certain elements. Supportive policies can provide technical support and guidance on best practices for designing PES.

The examples of legal frameworks discussed here show an increasing trend in law and policy developments directed at PES. This trend will likely continue as part of broader efforts to better account for the economic value of ecosystem services in natural resource management and sustainable development planning. The upstream-downstream nature of water management is especially conducive to PES development, and legal frameworks can implement an ecosystem services approach to both provide water services and conserve watersheds more cost effectively. This is of critical interest as policy-makers seek ways to meet human demands, reduce costs and protect earth's ecosystems on which we depend.

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[166] Cf Bennett, Carroll and Hamilton above (n. 149).