

Appendix A. Enabling conditions for PES programs identified from the literature with citations

	Enabling Condition	Summary of Enabling Condition	Citations
Biophysical Conditions	Small resource area ^{a; 1}	Smaller areas providing ES (as opposed to larger) facilitates the development of PES.	Fisher et al. 2010
	Resource location and arrangement ^{a; 1}	Proximity of beneficiaries to the location of ES provision facilitates the development of PES. Greater connectivity of intact ecosystems enhances provision of ES. Type and arrangement of land use impacts provision of ES.	Foley et al. 2005; Kremen 2005; Sommerville et al. 2009; Fisher et al. 2010; Mitchell et al. 2013; Muñoz Escobar et al. 2013; Turner et al. 2013 Wunder 2013;
	Well-defined boundaries of PES system ^{a, b; 2}	A confined resource system with clearly identified ES providers and beneficiaries and knowledge of resource system boundaries both spatial and functional facilitates development of PES.	Armsworth & Roughgarden 2003 Huang et al. 2009; Fisher et al. 2010; Kemkes et al. 2010; Asbjornsen et al. 2015
	Existing fundamental ecosystem science and baseline data ^{a; 2}	Basic scientific understanding of the ecological processes and interactions among ES in the specific ecosystem targeted by a program facilitates PES.	Postel & Thompson 2005 Kroeger & Casey 2007; Engel et al. 2008; Jack et al. 2008; Corbera et al. 2009; Huang et al. 2009; Sommerville et al. 2009; Rands et al. 2010; Swallow et al. 2010; van Noordwijk & Leimona 2010; Keeler et al. 2012; Lockie 2013; Ponette-Gonzalez et al. 2014; Asbjornsen et al. 2015; Rosenthal et al. 2015; Ruckelshaus et al. 2015
	Linkages between ES provision and management practices ^{a, b, c; 2}	The presence of a clear link between quantifiable management practices or readily monitored ecosystem functions and the provision of ES enables PES.	Kremen 2005; Balvanera et al. 2006; Quintero et al. 2009; Rands et al. 2010; Ponette-Gonzalez et al 2014; Asbjornsen et al. 2015; Rosenthal et al. 2015; Ruckelshaus et al. 2015
	Clear threat or risk to ES provision ^{a, c; 1}	Clear threats or risks to ES provision can facilitate development of PES by increasing demand for ES or stimulating increased awareness of ES benefits and their need for conservation among beneficiaries.	Kemkes et al. 2010; Rands et al. 2010; Swallow et al. 2010 Waite et al. 2015
Economic Conditions	Significant value of ES ^{a, c; 2}	When ES have clear value and benefits to human communities, efforts to protect these ES are more likely to occur since beneficiaries have incentive to compensate ES providers for provision.	Kroeger & Casey 2007; Engel et al. 2008; Keeler et al. 2012; Ruckelshaus et al. 2015; Waite et al. 2015
	Low opportunity costs ^{a, b, c; 2}	Where the value of the payments exceed the value of alternative land uses to the ES provider and the alternative ways of receiving the same benefit exceed the cost of the ES payment for the buyer PES are more likely to occur.	Engel et al. 2008; Jack et al. 2008; Sommerville et al. 2009; Muradian et al. 2010; van Noordwijk & Leimona 2010; Muradian et al. 2013; Sattler & Matzdorf 2013; Wunder 2013
	Manageable transaction costs ^{a, b, c; 2}	Manageable transaction costs increases the viability of PES. Low number of actors or organizational structures such as ES provider groups and ES that are easier to monitor help to reduce transaction costs.	Kroeger & Casey 2007; Engel et al. 2008; Corbera et al. 2009; Huang et al. 2009; Sommerville et al. 2009; Kemkes et al. 2010; Swallow et al. 2010; Sattler & Matzdorf 2013; Lockie 2013; Wunder 2013

Economic	Defining ES as an economic good or service ^{a; 2}	Rival and excludable goods make it easier to design PES than non-rival and non-excludable goods, however, monopsony can help overcome these challenges. Agreed upon methods for measuring and valuing ES can also help in defining an ES as economic good or service and facilitate PES development	Postel & Thompson 2005; Kroeger & Casey 2007; Engel et al. 2008; Jack et al. 2008; Kemkes et al. 2010; Sattler & Matzdorf 2013
	Economic growth ^{a; 1}	Rapid economic growth at local or national scales may increase the interest in and resources available for PES.	Huang et al. 2009
Governance Conditions	Presence/absence of Intermediaries ^{a, b, c; 3}	The presence or absence of intermediaries such as “boundary organizations” may influence PES development and implementation. [+] Some suggest intermediaries facilitate PES by providing technical resources and bridging trust gaps among buyers and sellers. [-] Others suggest intermediaries may inhibit PES by preventing direct interactions and negotiation.	[+] Engel et al. 2008; Kemkes et al. 2010; van Noordwijk & Leimona 2010; Sattler and Matzdorf 2013; [-] Sommerville et al. 2009
	Strong capacity among actors ^{a, b, c; 3}	Knowledge, technical expertise, financial resources, and stability of NGOs, agencies, and ES sellers facilitate PES. Strong capacity of non-state actors may compensate for weak state institutions.	Engel et al. 2008; Jack et al. 2008; Corbera et al. 2009; Huang et al. 2009; Sommerville et al. 2009; Swallow et al. 2010; Lockie 2013; Huber-Stearns et al. 2013; Lambin et al. 2014; Rosenthal et al. 2015; Ruckelshaus et al. 2015; Waite et al. 2015
	Influential champion ^{a, b; 2}	Presence of an influential supporter of PES such as politician or prominent NGO can help overcome inertia.	Swallow et al. 2010; Rosenthal et al. 2015; Ruckelshaus et al. 2015; Waite et al. 2015
	Strong existing institutions ^{a, b; 1}	Strong institutions (e.g., laws, policies, norms) can help the enforcement and adjudication of PES rules to ensure conditionality and provide clear and accepted mechanisms for revising rules. Pre-existing institutions that support conservation efforts can also provide the background in which PES can be designed to fill specific gaps.	Postel & Thompson 2005; Kroeger & Casey 2007; Engel et al. 2008; Corbera et al. 2009; Huang et al. 2009; Sommerville et al. 2009; Fisher et al. 2010; Rands et al. 2010; Swallow et al. 2010; Pirard 2012; Huber-Stearns et al. 2013; Lockie 2013; Muñoz Escobar et al. 2013; Muradian et al. 2013; Sattler and Matzdorf 2013; Ruckelshaus et al. 2015; Waite et al. 2015
	Secure land tenure and property type ^{a, b, c; 2}	Secure tenure and clearly defined property rights facilitate PES. Property type (e.g., private [+], public [+ or -], communal [-]) may also influence PES development.	Postel and Thompson 2005; Engel et al. 2008; Jack et al. 2008; Huang et al. 2009; Sommerville et al. 2009; Rands et al. 2010; Swallow et al. 2010; van Noordwijk & Leimona 2010; Sattler & Matzdorf 2013; Wunder 2013; Lambin et al. 2014
	Fit of governance structure with scale of PES ^{b; 3}	The governance structure ideally fits the scale of the PES. Local governance typically facilitates PES development more than top-down/hierarchical structures	Postel & Thompson 2005; Corbera et al. 2009; Huang et al. 2009; Sommerville et al. 2009; Ruckelshaus et al. 2015; Waite et al. 2015
	Multiple/single PES objectives ^{a, b; 3}	[+] Some scholars suggest multiple goals including social or economic development objectives facilitate PES development. [-] Others argue multiple objectives hinder PES.	Sommerville et al. 2009; Muradian et al. 2010; Kinzig et al. 2011

Social-Cultural Conditions	Trust and transparency among actors ^{a, b, c; 2}	High levels of trust and transparency among actors creates an environment of perceived fairness conducive to PES	Wunder 2013; Corbera et al. 2009; Fisher et al. 2010; Muradian et al. 2010; Rands et al. 2010; Swallow et al 2010; van Noordwijk & Leimona 2010; Lambin et al. 2015; Rosenthal et al. 2015; Ruckelshaus et al. 2015
	Stakeholder communication and engagement ^{a, b, c; 3}	Stakeholder involvement and communication in design and implementation can increase the buy-in and perceived legitimacy of PES among actors	Engel et al. 2008; van Noordwijk & Leimona 2010; Sattler & Matzdorf 2013; Rosenthal et al. 2015; Ruckelshaus et al. 2015; Waite et al. 2015
	Pre-existing market-based culture ^{a; 1}	A preexisting culture in which compensation is common or expected can facilitate PES	Huang et al. 2009; Lockie 2013; Wunder 2013
	Participant willingness ^{a, b, c; 2}	PES is facilitated when participation by providers is voluntary and there is strong support from ES buyers even if buyer participation is compulsory (e.g., government supported programs)	Postel & Thompson 2005; Jack et al. 2008; Sommerville et al. 2009; Pirard 2012; Sattler & Matzdorf 2013
	Proximity of actors to each other ^{a; 1}	Spatial proximity of actors, especially buyers and sellers, to each other facilitates PES	Engel et al. 2008; Fisher et al. 2010; Muradian et al. 2010; Kinzig et al. 2011
	Large/small number of actors ^{a; 2}	[+] Some authors suggest smaller groups are easier to organize. [-] Others suggest smaller groups may not have a critical mass to overcome transaction costs or spur competition among ES providers.	Corbera et al. 2009; Huang et al. 2009; Fisher et al 2010; [-] Lockie 2013

**The literature differs in directionality for some conditions. In these cases we specify summaries and citations indicating the condition as supporting PES with [+] and those indicating the condition as inhibiting PES with [-].*

^{a, b, c} Superscripts denote the stage(s) of the policy process that the conditions should be considered (a = scoping; b = Implementing; c = Sustaining). These groupings represent our interpretations as the reviewed literature did not directly address the relevant stages of the PES policy process.

^{1, 2, 3} Superscripts denote the level of influence practitioners likely have over each condition (1 = low; 2 = moderate; 3 = high). These groupings represent our interpretations as the reviewed literature did not directly address the levels of influence that practitioners have over the identified enabling conditions.