ABECO
ASSOCIAÇÃO BRASILEIRA DE CIÊNCIA ECOLÓGICA E CONSERVAÇÃO

Natureza & Conservação
Brazilian Journal of Nature Conservation
Supported by Boticário Group Foundation for Nature Protection
http://www.naturezaeconservacao.com.br

Policy Forums

The challenges of implementing a legal framework for Payment for Ecosystem Services in Santa Catarina, Brazil

Gisele Garcia Alarcon[a], *Luis Antônio dos Santos de Freitas*[b,*], *Glauber Oliveira da Fountoura*[b], *Carolina Ximenes de Macedo*[c], *Daniel Casarin Ribeiro*[b]

[a] *Fundação CERTI, Centro de Economia Verde, Florianópolis, SC, Brazil*
[b] *Diretoria de Mudanças Climáticas, Secretaria de Estado do Desenvolvimento Econômico Sustentável, Governo de Santa Catarina, Florianópolis, SC, Brazil*
[c] *Mestre em Sistemas Costeiros e Oceânicos, Curitiba, PR, Brazil*

ARTICLE INFO

Article history:
Received 13 March 2015
Accepted 21 May 2016
Available online 2 June 2016

In the last two decades, the Payment for Ecosystem Services (PES) tool has largely spread across the globe as an approach to address biodiversity loss and ecosystem services degradation (Wunder, 2015). The role of the State in PES programs varies from active buyer of ES, on behalf of ES beneficiaries, to regulator. A well-structured legal framework is defined as crucial for scaling positive results up of PES initiatives (Greiber, 2009; Stanton, 2014). However, little attention has been given to the political aspects behind the development of PES regulations, an important piece to guarantee PES functioning. In developing countries, political interests may play an important role in PES legislation establishment compromising its final goals. In this essay, we briefly discuss the status of PES legislation in Brazil and address the challenges faced by Santa Catarina state to get off the ground its PES policy.

Around eight publications discussing PES concepts have been presented by Matzdorf et al. (2013) and at least two other recent ones might be added (Noordwijk and Leimona, 2010; Wunder, 2015). Here, the concept followed defines PES as a "transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources" (Muradian et al., 2010).

Within this framework, Governments can assume the role of ecosystem service (ES) "buyer" and/or of a legal actor. In the first case, Governments are responsible for financing or co-financing PES programs, what is generally observed for non-rival and non-excludable services, such as habitat for biodiversity and climate regulation (Jack et al., 2008; Kemkes et al., 2010). In the second, Governments can establish regulation for compensation payments within the environment impact

* *Corresponding author.*
E-mail address: luisdefreitas1@yahoo.com.br (L.A.d.S. de Freitas).
http://dx.doi.org/10.1016/j.ncon.2016.05.003

assessment framework (EIA) and others, and define proper regulations for PES programs in local, regional and national levels (Matzdorf et al., 2013).

The role of the State and the development of an appropriate legal framework are considered critical for PES to properly function (Balvanera et al., 2012; Farley and Costanza, 2010; Greiber, 2009; Richards et al., 2015). However, it is known that some of the legislation supporting PES are poorly designed due to the lack of technical capacity and their susceptibility to political pressures (Pattanayak et al., 2010; Pirard, 2012; Wunder et al., 2008). Political interest can play a major role in the design and implementation of PES programs, pushing ecosystem service provision and/or improvement into second place (Engel et al., 2008; Greiber, 2009; Pattanayak et al., 2010). Examples of political influence in PES design and implementation have been observed in Mexico (Alix-garcia et al., 2005; Corbera et al., 2009), Costa Rica (Pagiola, 2008), Indonesia (Pirard, 2012) and Brazil (Tejeiro and Stanton, 2014).

Within Brazil, PES policies emerged in the last decade inspired by other pioneer experiences across Latin America. The first PES program was launched in 2001 in the municipality of Extrema, Minas Gerais state. The legal framework used was the National Water Resources Policy from 1997, which established the granting of water usage rights and pricing mechanisms (Santos et al., 2013). From 2001 until 2015 there were nine states with laws and decrees specifically regulating PES, another six states with other legislation regulating PES and eight states with draft bills regulating the topic. A study hold in 2012 by the Brazilian Institute of Geography and Statistics (IBGE) pointed out that 418 municipalities across the country paid for ecosystem services conservation/provision (IBGE, 2013). Of these programs 47% were established by municipal law and 8% by decree.

In general, most of the PES programs and projects in Brazil are supported by other environmental legislation, often regulating specific funds for water and climate change mitigation or adaptation (Santos et al., 2012; Tejeiro and Stanton, 2014). Moreover, several initiatives are just pilot projects developed with the support of non-governmental organizations and do not count with a proper regulation (Guedes and Seehusen, 2011; Souza, 2011; Richards et al., 2015; Santos and Vivan, 2012).

Most of the Brazilian state and municipal laws were promulgated after PES pilot projects. Yet, pilot projects that aimed to support the legal framework have experienced discontinuity in payments, change in scope in disregard of previous contracts and change in payment criteria and document requirements, what have caused loss of confidence within the communities involved (Lavrati et al., 2014; Tejeiro and Stanton, 2014; Richards et al., 2015). In Paraná state, for example, environmental restrictions established by the PES law prevented payments for conservation and restoration of Permanent Preservation Areas (PPA) and Legal Reserve (LR), resulting in the repeal of some articles of the original law (Paraná, 2014, 2012). In Espírito Santo, the partial repeal of law no. 8.995/2008 substantially changed the focus and structure of the PES in the state, causing mistrust between project practitioners and local stakeholders (Tejeiro and Stanton, 2014).

The first proposal for a National PES Policy was drafted in 2007 (federal draft bill no. 792/2007). However, in recent years this bill has received numerous appended draft bills dealing with similar proposals, all of them very focused on income transfer actions. In 2013 and 2015 emerged two independent proposals (federal draft bills no. 276/2013 and no. 312/2015) more aligned with the 2007 draft bill emerged. Both prioritized results for improvement and maintenance of ecosystem services. None of the bills has been approved.

Specifically the draft no. 792/2007 tried to balance environmental and social aspects and is more socially driven (Godecke et al., 2014; Santos and Vivan, 2012; Santos et al., 2012). In terms of equity and distribution for a national PES policy, such balance could add important improvements (Corbera et al., 2009; Muradian et al., 2010), but could also limit the efficiency of conserving the biodiversity in large private properties (Engel et al., 2008). Another important aspect is related to the restriction of payments for conservation and restoration of Permanent Preservation Areas (PPA). PPA were established by the National Forest Act (Brasil, 2012), that states the conservation of native vegetation covering hilltops, areas over 45°, in strips along rivers and around springs, and of areas above 1800 m height. In most of the Brazilian states, PES legislation allows payments for conservation and restoration of PPA, and most of the PES projects under development comprise mainly these areas. If the original text of the law is maintained, a significant number of the PES projects will be in disagreement with the mandates of the law.

The constraints observed in the federal PES proposal, and in the examples briefly mentioned, can also be seen in Santa Catarina's PES policy. A PES law enacted in 2010 was not implemented in the following years and in 2014 an alternative version of the law was prepared for the State Congress. Challenges faced since the law promulgation and recent strategies developed for the PES policy implementation in Santa Catarina state are presented next.

Santa Catarina PES Policy Framework: constraints to get off the ground

In 2010 Santa Catarina promulgated law no. 15.133 establishing the State PES Policy and Program. The policy implementation is based on three sub-programs: water, forests and protected areas. The reference value for PES payments is equivalent to the value of 30 sacks of corn per hectare per year, according to the Minimum Price Guarantee Policy (PGPM) established by the Federal Government.[1] Further, the payments are made according to three classes, Class I (100% of the value), Class II (50%) or Class III (20%), depending on three criteria: site location, farmers' socioeconomic characteristics and ecosystem service relevance within the landscape. Small-scale farmers are to be prioritized for the payments under the classes I and II. PES projects evaluation, payments classification, priority areas definition and PES projects monitoring is overseen by a committee, formed just by five representatives,

[1] Current value of a sack of corn, according to the PGPM, is R$ 17.67 (US $ 4.64). Therefore, the referenced value of 30 sacks of corn corresponds to R$ 530.10 (US $ 139.28).

from State Agencies. There is no restriction for payments for areas under compliance (Santa Catarina, 2010).

The establishment of a reference value equivalent to 30 "sacks of corn" for PES payments was a result of political pressure coming from the State Agriculture and Livestock Federation and the deputies representing small-scale farmers. Usually, farmers charge this value for land lease operations, although land opportunity costs can be much lower (CEPA, 2015). However, determining a reference value disregards important aspects central to any PES program, as the funding available and the structure of the funding mechanism, the land opportunity cost variation, the willingness to pay and to accept from the potential beneficiaries and providers, respectively, and the nature of the ecosystem service.

The definition of classes for payments depends upon criteria for measuring environmental or ecosystem services quality. These criteria would be defined in a specific regulation supposed to be published 90 days after the law has been issued, but it was never presented at the State Congress. Moreover, the composition of the small technical committee responsible for analyzing all PES projects and for its classification, depending on their environmental performance, disregards the project location, sub-program classification and the committee members' knowledge about the region (field experience) and ecosystem service generated.

For the three following years, after the PES law promulgation, efforts to establish PES projects under the umbrella of the state legislation were unsuccessful. In 2013, the State Board of Climate Change gathered representatives from institutions and specialists knowledgeable about PES and created a working group to lead the reform of the law. The working group identified several barriers, including:

- Institutional – the State as unique executor and the lack of infrastructure for the analysis of documents and generation of contracts with ecosystem service providers;
- Economic – financial resources flow with restrictions due to bureaucratic processes related to public expenditure, resulting in difficulty to maintain the annual payments for the contracts generated; and,
- Technical – lack of human resources affecting the potential scale of the program, standardization of the PES payment value and overlapping of the subprograms.

Based on these constraints, a draft bill of law no. 15.133/2010 was consolidated and made available on a platform for online public consultation for 30 days during May 2014. The draft bill proposes the improvement and correction of the restrictions highlighted above; improves and clarifies important concepts and provides the tools that would enable the law implementation by defining more general guidelines that could be adapted to variations at the state and the local levels. The main changes of the draft bill to current law[2] include the following (Table 1):

[2] For more information and details, consulting https://sgpe.sea.sc.gov.br, process DSUST no. 290/2014.

Political challenges for PES policy implementation in Santa Catarina

There are several challenges associated to the implementation of public policies by the State. Some of them include: compliance with different political interests and economic sectors that are directly affected; discontinuity of projects related to political parties and their permanence in the government; and difficulty of providing the necessary financial resources over a long period of time that are associated with a large and often excessive bureaucracy involved with disbursing these resources. The development and implementation of a public policy focused on ecosystem service provisioning becomes crucial for an economy heavily dependent on the first sector, resulting in direct benefits to the farmers and to the maintenance of their agricultural activities (Martinelli and Filoso, 2009; Martinelli et al., 2010a; Power, 2010). Likewise, historically, nature conservation strategies have been seen as "obstacles to progress", causing innumerous conflicts of interests (Martinelli et al., 2010b; Tollefson, 2010). However, agricultural production strongly relies on ecosystem services provision and PES (Ango et al., 2014; Parron et al., 2015; Power, 2010). If conflicts uphold ES conservation and agricultural activities in opposing sides and interests, the facts are being misconducted and misinterpreted.

As a relatively recent approach, PES policies in Brazil are facing difficulties of being developed at municipal and state levels (Pagiola et al., 2012; Zanella et al., 2014). Additionally, the lack of federal law applied to PES increases the legal uncertainty of how this issue should be treated in a country of continental dimensions (Santos et al., 2012; Tejeiro and Stanton, 2014).

Many questions arise when planning a PES policy. For example, how can a PES policy be designed to guarantee long term funding, with permanent and positive results for ecosystem services provision? How to suitably address ecosystem service conservation or any policy under the scarce technical capacity and the discontinuation of actions undertaken by the local and federal government?

Aiming to overcome funding shortage, PES should be supported by mixed sources (public and private) mainly by implementing taxation for negative environmental externalities. The limited technical capacity and lack of stability in the public sector has to be focused by the establishment of programs developed in partnership with different stakeholders. Under this arrangement, public sector would be attributed as regulator and supporter more than an executive player.

In Santa Catarina, current challenges for effective implementation of the state PES Policy are mostly related to the approval and publication of the draft bill. Actually, the bill is being analyzed by the Governor and should be sent to the State Congress for evaluation. In the Congress, the different political interests may result in a modification of the text in order to address the demands of specific economic sectors, as the Agriculture. Due to the preferences previously showed by deputies in restricting the PES payments only for small-scale farmers and to allocate the payments primarily in regions with low human index development in disregard of environmental

Table 1 – Comparison between actual and the draft bill for PES in Santa Catarina State.

Actual PES law 15.133/2010	Draft bill	Impacts expected with changes
The State Government as unique executor and funder	The State Government as technical and economic PES supporter	Governance decentralization should improve implementation and diversify PES funders
Standardization of the minimum PES payment value (30 sacks of corn per hectare per year)	Establishment of an indicative formula to value Ecosystem Services based on Oásis methodology (Young and de Bakker, 2014)	Improves the methodology for the payments' value calculation based on a validated formula (Oasis). The allowance to use other methodologies for valuation enables each program to be adjusted to its own governance system and to the local ecological characteristics
3 Subprograms	Without subprograms categories	It avoids the overlapping of programs, as ecosystem services are commonly linked to a given ecosystem and usually appear together in time and space (Berry et al., 2015)
Payment classification	No classification by an economic value definition	The Oasis formula subsidizes the payments' value calculation based on a large range of ecological criteria applied to each site, which is much more complete than the criteria listed in the law.
Prioritization for small-scale farmers for full payments and per Subprogram	No prioritization of farmers' socioeconomic categories	The change results in equal treatment for farmers, independently of their social status. In one hand, it makes the program attractive to all. However, in other hand, it can rise the payments' values of the programs
A committee, formed just by five representatives from State Public Agencies, to manage all program execution.	Indication for the establishing of local management committees to be regulated according to each PES program/scheme	The measure promotes a great improvement in the policy governance system

aspects and priorities, technical and scientific consultancy has to be advocated. This would inform on the number of farmers that would be elected to get PES, on the environmental priorities to be addressed, and on the cost-benefit between the payments and the ES conservation. This would also hamper political and legal issues of being decided disregarding the environmental issues, such as the priorities areas for ES conservation and, mostly the effective protection of ES to each area elected to receive the payments.

Once the PES was designed facing the crucial environmental issues (listed above), combined to political and legal challenges to overcome, the next steps would include the definition of clear criteria for prioritizing areas within the state, structuring of environmental assessments in order to evaluate ecosystem services provision and quality, identifying providers and beneficiaries, defining the monitoring parameters and articulating stakeholders.

There is a great local expectation that the PES law will be effectively implemented in Santa Catarina. This could be an opportunity to properly address the contend involving environmental conservation and the National Forest Act, recently changed and still in debate, but that compromised ES support for human wellbeing and for agricultural activities. The State Agriculture and Livestock Federation is expecting farmers to be compensated for restoring and conserving forested areas. Farmers expect to be compensated for setting aside forested areas and for restoring ecological susceptible areas in their properties. Natural Scientists are expecting that important natural areas are restored and preserved, guarantying the long-term maintenance of ecological processes. However, for addressing such demands, the changes proposed in the bill are crucial and the most plausible way to get the Santa Catarina PES policy finally off the ground.

Conflicts of interest

The authors declare no conflicts of interest.

REFERENCES

Alix-garcia, J., de Janvry, A., Sadoulet, E., Torres, J.M., 2005. An Assessment of Mexico's Payment for Environmental Services Program. FAO, Berkley.

Ango, T.G., Börjeson, L., Senbeta, F., Hylander, K., 2014. Balancing ecosystem services and disservices: smallholder farmers' use and management of forest and trees in an agricultural landscape in southwestern Ethiopia. Ecol. Soc., 19.

Balvanera, P., et al., 2012. Ecosystem services research in Latin America: the state of the art. Ecosyst. Serv. 2, 56–70.

Berry, P., et al., 2015. Ecosystem service bundles. In: OpenNESS., pp. 1–5, Available at http://www.openness-project.eu/sites/default/files/SP_ES-Bundles.pdf (access April 2016).

Brasil, 2012. Lei no 12.651 de 25 de maio de 2012, Available at http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12651.htm (access November 2015).

CEPA, 2015. Preço da Terra: 2009–2014, URL. Available at http://www.epagri.sc.gov.br/?page_id=2711 (access September 2015).

Corbera, E., Soberanis, C.G., Brown, K., 2009. Institutional dimensions of Payments for Ecosystem Services: an analysis of Mexico's carbon forestry programme. Ecol. Econ. 68, 743–761.

Engel, S., Pagiola, S., Wunder, S., 2008. Designing payments for environmental services in theory and practice: an overview of the issues. Ecol. Econ. 65, 663–674.

Farley, J., Costanza, R., 2010. Payments for ecosystem services: from local to global. Ecol. Econ. 69, 2060–2068.

Godecke, M.V., Hupffer, H.M., Chaves, I.R., 2014. O futuro dos Pagamentos por Serviços Ambientais no Brasil a partir do novo Código Florestal. Desenvolv. e Meio Ambient 31, 31–42.

Greiber, T., 2009. Payments for Ecosystem Services Legal and Institutional Frameworks. IUCN, Gland.

Guedes, F.B., Seehusen, S.E., 2011. Pagamento por Serviços Ambientais na Mata Atlântica. Ministério do Meio Ambiente, Brasília.

IBGE, 2013. Perfil dos Municípios Brasileiros – 2013, Available at http://www.ibge.gov.br/home/estatistica/economia/perfilmunic/2013/ (access April 2016).

Jack, B.K., Kousky, C., Sims, K.R.E., 2008. Designing payments for ecosystem services: lessons from previous experience with incentive-based mechanisms. Proc. Natl. Acad. Sci. U.S.A. 105, 9465–9470.

Kemkes, R.J., Farley, J., Koliba, C.J., 2010. Determining when payments are an effective policy approach to ecosystem service provision. Ecol. Econ. 69, 2069–2074.

Lavrati, P., Tejeiro, G., Stanton, M., 2014. Sistemas Estaduais de Pagamento por Serviços Ambientais: diagnósticos, lições aprendidas e desafios para a futura legislação. In: Lavrati, P., Tejeiro, G., Stanton, M. (Eds.), Instituto por um Planeta Verde. São Paulo, p. 309.

Martinelli, L.A., Naylor, R., Vitousek, P.M., Moutinho, P., 2010a. Agriculture in Brazil: impacts, costs, and opportunities for a sustainable future. Curr. Opin. Environ. Sustain. 2, 431–438, http://dx.doi.org/10.1016/j.cosust.2010.09.008.

Martinelli, L.A., Filoso, S., 2009. Balance between food production, biodiversity and ecosystem services in Brazil: a challenge and an opportunity. Biota Neotrop. 9, 21–25.

Martinelli, L.A., et al., 2010b. A falsa dicotomia entre a preservação da vegetação natural e a produção agropecuária A falsa dicotomia entre a preservação da vegetação natural e a produção agropecuária. Biota Neotrop. 10, 323–330.

Matzdorf, B., Sattler, C., Engel, S., 2013. Institutional frameworks and governance structures of PES schemes. For. Policy Econ. 37, 57–64.

Muradian, R., et al., 2010. Reconciling theory and practice: an alternative conceptual framework for understanding payments for environmental services. Ecol. Econ. 69, 1202–1208.

Noordwijk, M.V., Leimona, B., 2010. Principles for fairness and efficiency in enhancing environmental services in Asia: payments, compensation, or co-investment? Ecol. Soc., 15.

Pagiola, S., 2008. Payments for environmental services in Costa Rica. Ecol. Econ. 65, 712–724.

Pagiola, S., Glehn, H.C.V., Taffarello, D., 2012. Experiências do Brasil em Pagamentos por Serviços Ambientais. In: Pagiola, S., Glehn, H.C.V., Taffarello, D. (Eds.), Experiências de Pagamentos Por Serviços Ambientais no Brasil. Secretaria do Meio Ambiente do Estado de São Paulo, São Paulo, pp. 321–336.

Paraná, 2014. Lei no. 18.295 de 10 de novembro de 2014, Available at https://www.legisweb.com.br/legislacao/?id=276715 (access September 2015).

Paraná, 2012. Lei no. 17.134 de 25 de abril de 2012, Available at http://www.legislacao.pr.gov.br/legislacao/pesquisarAto.do?action=exibir&codAto=67272&indice=1&totalRegistros=1 (access September 2015).

Parron, L.M., et al., 2015. Serviços Ambientais em Sistemas Agrícolas e Florestais do Bioma Mata Atlântica. EMBRAPA, Brasília.

Pattanayak, S.K., Wunder, S., Ferraro, P.J., 2010. Show me the money: do payments supply environmental services in developing countries? Rev. Environ. Econ. Policy 4, 254–274.

Pirard, R., 2012. Payment for Environmental Services in the public policy landscape: mandatory spices in the Indonesian recipe. For. Policy Econ. 18, 23–29.

Power, A.G., 2010. Ecosystem services and agriculture: tradeoffs and synergies. Philos. Trans. R. Soc. Lond. B: Biol. Sci. 365, 2959–2971.

Souza de, P.M.M., 2011. Análise dos Modelos de Pagamento por Serviços Ambientais (PSA) no Brasil e no Mundo no que concerne a restauração e conservação de matas ciliares e outras Áreas de Preservação Permanentes (APP). IICA, Salvador.

Richards, R.C., et al., 2015. Governing a pioneer program on payment for watershed services: stakeholder involvement, legal frameworks and early lessons from the Atlantic forest of Brazil. Ecosyst. Serv. 16, 23–32.

Santa Catarina, 2010. Lei no. 15.133, de 19 de janeiro de 2010, Available at http://www.portaldoservidor.sc.gov.br/ckfinder/userfiles/arquivos/Legislacao%20Correlata/Leis%20Ordinarias/2010_-_LEI_N%C2%BA_15_133,_de_19_de_janeiro_de_2010.pdf (access January 2016).

Santos dos, D.G., Melo de, V.G., Carvalho de, F.H., 2013. Programa Produtor de Água. In: Pagiola, S., Glehn, H.C.V., Taffarello, D. (Eds.), Experiecnicas de Pagamento Por Serviços Ambientais No Brasil. Secretaria do Meio Ambiente do Estado de São Paulo, São Paulo, pp. 233–248.

Santos dos, R.F., Vivan, J.L., 2012. Pagamento por Serviços Ecossistêmicos em perspectiva comparrada: recomendações para tomada de decisão. Projeto Apoio aos Diálogos Setoriais UE-Brasil, Brasília.

Santos, P., et al., 2012. Marco Regulatório sobre Pagamento por Serviços Ambientais no Brasil. IMAZON/FGV/CVces, Belém.

Stanton, M., 2014. O papel do direito na proteção dos serviços ecossistêmicos. In: Lavratti, P., Tejeiro, G. (Eds.), Direito e Mudanças Climáticas. , pp. 108–118.

Tejeiro, G., Stanton, M., 2014. Sistema Estaduais de Pagamento por Serviços Ambientais: diagnóstico. In: lições aprendidas e desafios para a futura legislação. Instituto O Direito por um Planeta Verde, São Paulo.

Tollefson, J., 2010. The global farm. Nature 466, 554–555.

Wunder, S., 2015. Revisiting the concept of payments for environmental services. Ecol. Econ. 117, 234–243.

Wunder, S., Engel, S., Pagiola, S., 2008. Taking stock: a comparative analysis of payments for environmental services programs in developed and developing countries. Ecol. Econ. 65, 834–852.

Young, C.E.F., de Bakker, L.B., 2014. Payments for ecosystem services from watershed protection: a methodological assessment of the Oasis Project in Brazil. Nat. Conserv. 12, 71–78.

Zanella, M.A., Schleyer, C., Speelman, S., 2014. Why do farmers join Payment for Ecosystem Services schemes? An assessment of PES Water Scheme participation in Brazil. Ecol. Econ., 166–176.