

3 year PHD THESIS FELLOWSHIP (ED EES Université de Bordeaux 2020)

Bargaining over Environmental Public Goods

The PhD thesis will be co-supervised (“co-tutelle”) and the successful candidate will work at CSIC, Institute for Public Goods and Policies (IPP) in Madrid, Spain, and at the CNRS GREThA unit in Bordeaux, France, half time in each unit, within the International Research Project CNRS-CSIC ALLIES. The fellowship involves no teaching. Please contact the supervisors before **May, 22**.

Supervisors

Alejandro CAPARROS Institute for Public Goods and Policies (IPP), Spanish National Research Council (CSIC), Madrid, Spain, alejandro.caparros@csic.es
<http://ipp.csic.es/en/personal/alejandro.caparros>

JC PEREAU (GREThA, Université de Bordeaux), jean-christophe.pereau@u-bordeaux.fr
<https://gretha.cnrs.fr/jean-christophe-pereau>

Context and problematic

The fight against global warming, the protection against environmental risks and the management of natural resources are all examples that require the collective management of a public good by several stakeholders. The spatial (global or local scale) and temporal (simultaneous or sequential) dimensions of the **public good** and its management may be different depending on the case, which implies defining a new theoretical framework to take into account this diversity and explain the decision-making processes. The **question of multilateral negotiation** is central to a common understanding of these issues. The resolution of most of these bargaining games is based on a Nash-in-Nash procedure consisting in a Nash equilibrium computed from a set of Nash bargaining solutions between “buyers” and “sellers”.

Although the details can be adjusted to suit the interests of the successful candidate, the research agenda for this PhD thesis will touch upon three main applications or essays:

- i) Climate change and International Environmental Agreements;
- ii) Multilateral Externalities and Environmental Agreements;
- iii) Payments for Ecosystem Services (PES) and natural resources management

Essay 1: Climate change and International Environmental Agreements

Most of the bargaining models have been developed to reproduce the IEA negotiation initiated in 1992 when all the countries in the world signed and ratified the UNFCCC. This negotiation structure has been modified with the Paris Agreement, at COP 21 (Caparrós, 2016a and 2016b). In this new context, new research questions emerge. How will negotiations be conducted with respect to article 6 of the Paris Agreement to ensure that the sum of the individual non-binding commitments respect the global target? What will be the bargaining power of the “pivotal” country or coalition, which will be crucial for the global agreement? How may the outside options of the countries affect their bargaining strategies?

Essay 2: Multilateral Externalities and Environmental Agreements

Coase (1960) argued that bargaining with side payments can solve pollution problems without the need of government intervention, and that only transaction (or bargaining) costs can prevent voluntary bargaining from attaining Pareto-efficient outcomes. Although Coase claimed that his result holds generally, and not only for two players, moving to a multilateral framework raises several questions. A possible application may concern environmental risk management and in particular flood risk management. This issue has been analyzed by Hirshleifer (1983) concerning the building of seawalls or dikes for protecting people against storms and flood risk. This paper popularized the “weakest-link” concept, as one of the relevant aggregation technologies for local public goods (Caparrós and Finus, 2020). This question has been recently studied by Delille and Perea (2014) in a negotiation framework dealing with a hierarchical public good together with positive and negative externalities.

Essay 3 : PES and Natural resources management

The literature has recommended the use of Payment for ecosystem services (PES) to manage environmental assets (Wunder, 1995). The Coasean conceptualization of PES shows that bargaining is a relevant approach to achieve cooperation and agreement when a resource or a land is exploited by several users. Thus, PES can also be analysed in terms of negotiations. Whilst very few PES schemes take place between only one supplier and one buyer, most cases involve large coordination efforts between several suppliers and buyers, frequently including also intermediaries. Up to now, few analyses have taken this into account.

References

- Caparrós, A. (2016a) Bargaining and International Environmental Agreements, *Environmental and Resource Economics* 65(1): 5–31.
- Caparrós, A. (2016b) The Paris Agreement as a step backward to gain momentum: Lessons from and for theory, *Revue d'Économie Politique* 126(3): 347-356.
- Caparrós, A., JC Perea (2017) Multilateral versus sequential negotiations over climate change, Special issue on Transnational Environmental Protection, *Oxf Econ Pap*, 2017, 69(2) April.
- Caparrós, A. and Perea, J.-C. (2013) Forming coalitions to negotiate North-South climate agreements, *Environment and Development Economics*, 18, 69–92.
- Caparrós, A. and Finus M (2020) Public good agreements under the weakest-link technology, *J. Public Econ Theory*, 1–28
- Coase, R.H. (1960), The Problem of Social Cost, *Journal of Law and Economics*, 3:1-44.
- Delille R. and JC, Perea (2014) The Seawall Bargaining Game, *Games*, 5:127-139
- Finus, M. and Caparros, A. (2015) Game Theory and International Environmental Cooperation: Essential Readings, Edward Elgar, Cheltenham.
- Hirshleifer, J. (1983) From weakest-link to best-shot: The voluntary provision of public goods. *Public Choice*, 41, 371–386.
- Muthoo, A. (1999) Bargaining Theory with Applications, Cambridge University Press, Cambridge.
- Rubinstein A. (1982), Perfect equilibrium in a bargaining model, *Econometrica*, 50:97-109
- Wunder., S. (2005). Payments for Environmental Services: Some Nuts and Bolts. Occasional Paper No. 42. CIFOR, Bogor.