



PhD Position in Ecological Economics
Ecological-Economic Resilience of Tropical Coastal Ecosystems
Luc Doyen



Topic: Resilience factors into many decisions and policies including risk management in the private sector (Sheffi 2015), development and finance investments (e.g. OECD 2018) and management objectives of influential multilateral and UN agencies (e.g. FAO; World Bank). However, scientists and decision-makers lack a shared understanding of resilience and practical applications in environmental management are rare (Béné & Doyen, 2018). Here, following Grafton, Doyen et al. (Nature Sustainability, 2019), ecological-economic resilience is defined through three characteristics of systems — resistance, recovery and robustness (3 R's). Resilience management thus consists in actions that improve these 3 R's. The project ENTROPIC '*Ecological-Economic Resilience of Tropical Coastal Ecosystems*', funded by CNRS (Centre National Recherche Scientifique), will apply this 3 R's framework for the management of coastal tropical ecosystems in connection with both fishery management and mangrove management. ENTROPIC is strongly interdisciplinary as it brings together scientists from economics (GREThA, University of Bordeaux) and ecology (LEEISA, University of French Guiana).

The doctoral project, funded by the CNRS, consists in applying the general ideas of the project ENTROPIC. It will rely in particular on the case study of French Guiana where both the small-scale fishery and the mangrove play major ecological and economic roles and face major uncertainties including climate change and demographic growth. More specifically, the doctoral student will (i) develop ecological-economic models calibrated on historical data provided by the LEEISA (ii) derive different scenarios, management strategies and public policies from these dynamic models (iii) compare the ecological-economic performances of these projections in terms of resilience management and the 3Rs. The ecological-economic evaluation under consideration will combine scores of biodiversity, ecosystem services and economic development. Such projective works will thus expand and reinforce existing results (Cissé et al, 2015; Doyen et al., 2017; Diop et al., 2018) for the resilience management of tropical coastal ecosystems.

Keywords: Ecological-economics, Resilience, Biodiversity, Ecosystem services, Fisheries, Mangrove, Scenario.

Skills of the candidates: The candidate will be trained in resource economics and/or risk economics and/or conservation biology. He/She should be interested in applied research, decision support and modeling as well multidisciplinary approaches.

Hosting institution: GREThA (Groupe de Recherche en Economie Théorique et Appliquée, <http://gretha.u-bordeaux.fr/fr>) University of Bordeaux, France ; Stays in French Guiana at LEEISA are also planned.

Supervision: Luc Doyen (CNRS, GREThA, University of Bordeaux) & Fabian Blanchard (LEEISA, Ifremer & University of French Guiana)

Duration: 3 years ; Start : September 2020

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Some references:

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- Diop B., Sanz N., Blanchard F., Walcker R. & Gardel A. (2019) The role of mangrove in the French Guiana shrimp fishery, *Journal of Environmental Economics and Policy*, *8:2*, 147-158, DOI: 10.1080/21606544.2018.1522601
- Doyen, L, Béné, C, Bertignac, M, et al. Ecoviability for ecosystem-based fisheries management. *Fish Fish*. 2017; *18*: 1056– 1072. <https://doi.org/10.1111/faf.12224>