



Analysis

Biodiversity offset markets: What are they really? An empirical approach to wetland mitigation banking



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1. Introduction

Market-based instruments, among them tradable permits, are increasingly being used to manage environment and natural resources such as transferable fishing quotas and the carbon market (Pirard, 2012). For a long time, the only existing environmental offset market was the carbon market (Pirard, 2012). Other biodiversity offset markets are currently emerging, such as species and streams banking, but neither is as mature as wetland banking in the United States (Madsen et al., 2011). Most lessons for environmental markets are drawn from the latter (NRC, 2001; Bendor et al., 2011). The aim of wetland mitigation banking is to restore large scale wetland areas in order to compensate for impacts on nearby, similar wetlands (Hough and Robertson, 2009). Exchanges between the gains from the restoration and the losses from the impacts are carried out through a market of “mitigation credits” under the control of regulators. The ultimate goal is to achieve no net loss of wetland in the service area (USACE and USEPA, 2008).

Grey and scientific literature use the word “market,” or combined words using this term such as “market-based instrument” (Eftec et al., 2010), “biodiversity market” (Madsen et al., 2010, 2011), “credit market” (Van Teeffelen et al., 2014), or “permit market” (Wissel and Wätzold, 2010), when they refer to the mitigation banking system; however,

some authors question the real nature of this so-called “market”. For instance, Boisvert et al. (2013) question the limits of classifying biodiversity offsets as market based instruments, but they do not give criteria to define them, and Vatn (2014) gives a standardized description of trade based biodiversity offsets which are “complete markets with intermediaries”. However, the latter two articles are based on descriptive theoretical approaches and do not provide empirical evidence to support their assumptions.

To address this lack of empirical analysis of the “market nature” of wetland mitigation banking system, we carried out a field research study with actors in the wetland mitigation banking system in Florida, the region with the largest area covered by mitigation banks (Regulatory In lieu fee and Bank Information Tracking System (RIBITS)). Using this empirical evidence, the present paper describes the functioning of the mitigation banking system (Section 3.1) and shows that wetland mitigation banking is a hybrid form rather than a pure “market”. To do this, it uses three complementary approaches: a conventional economic approach (Section 3.2), an empirical sociological approach (Section 3.3) and a new institutional economics theory approach (Section 3.4).

2. Materials and Methods

2.1. Field Research on the “State of Wetlands”: Florida

Field research was carried out in Florida in 2013. Around 20 mitigation bank locations were toured and 54 face-to-face semi-structured interviews were carried out with various actors of the mitigation banking system. The outline of the interview for mitigation bankers is presented in Electronic Appendix A. All categories of persons involved in the mitigation banking system, except developers, were interviewed. Among the 54 interviewees, 20 are environmental consultants, 28 have a role in the mitigation bank project (as a landowner, a manager or a mixed status, including other tasks such as operating the bank or selling the credits), 4 are brokers, 7 are regulators, and 6 belong to other professions (e.g. lawyer, academic) (Table 1). As shown in Table 1, among these 54 persons, 36 have only one role, 12 combine 2 roles, 5 combine 3 roles, and one combines 4 roles. The detailed list of respondents with their role allocation within the mitigation banking system can be found in Electronic Appendix B. Most of them are environmental consultants and mitigation bankers. In order to keep the interviewees anonymous, no names of banks or respondents are given.

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Table 1
Sample of interviewed actors of the mitigation banking system of Florida.

Role		Number of actors	
Environmental consultant		20	
Mitigation banker	Landowner	13	28
	Manager	17	
	Mix	12	
Regulator		7	
Other professions (broker, lawyer or academic)		10	
TOTAL		54	

These interviews provided information on 71 of the 91 approved or pending banks at the time of the field work (Electronic Appendix C). The qualitative and quantitative information from the interviews and from some shared documents have been gathered in a database. Some qualitative information has been transformed to quantitative data when it was possible and relevant. Qualitative data were necessary to describe the mitigation banking system. These data enabled us to describe step by step the mitigation banking system and then to define its organizational nature using the three complementary frameworks we present in the following Section (2.2).

2.2. Three Complementary Frameworks to Analyze What Counts as a Market

2.2.1. A Conventional Economic Approach

From a conventional economic point of view, a market is characterized by a demand, a supply, a transaction of goods or services and a price (Samuelson and Nordhaus, 1948). There are also criteria of property rights, information on goods and services, real location (e.g. a territory) or virtual location (e.g. stock market), level of competition, and rules organizing transactions. These nine criteria are used to define a market with a conventional economic approach.

2.2.2. An Empirical Sociological Approach

Rosenbaum (2000) proposes a critical synthetic approach to the market definition with a view to operationalize the notion and to locate it among all existing organizational forms. This approach takes into account the sociological aspects of the way markets function, in addition to the “technical characteristics” of the economic definition of markets (Section 2.2.1). There is a gradient between a pure market and a hierarchy. Rosenbaum’s approach suggests criteria to distinguish markets from other organizational forms, based on the observation that “many economists find markets almost everywhere on Earth and in history” (Rosenbaum, 2000, p. 1). If the following criteria are met, then the observed trade can be described as market trade.

- “Voluntariness”: the freedom to choose an alternative to the transaction or to withdraw from the transaction if no alternative exists;
- Specificity: there is mutual agreement of both parties on the exact conditions of the terms of the transaction;
- Regularity and typification: traded goods, their prices, and in some cases the two parties should be similar for a number of significant transactions on a significant period of time. It is not an isolated trade and traded goods are a priori known;
- Competition (in the Simmelian sense): indirect conflict conducted in parallel by sellers and buyers, with the temporary possibility of maintaining an information asymmetry on transactions in order to provide opportunities for trade preferred by buyers or sellers. It approaches the neoclassical sense of competition on one point: monopsony and monopoly without the possibility of withdrawal from the transaction are not considered as competitive situations.

Thus, we have four criteria for defining a market from an empirical sociological approach.

Table 2
Three fundamental criteria of hybrid forms (from Ménard, 2003, 2004).

Regularity	Description
Pooling resources	–Coordination and cooperation (common investments), continuity in the relationship –Selective rather than open systems (choice of partners, barriers to entry or to exit from the system) –Necessary joint planning (may concern inputs, quantity, quality standards, price, training of personnel, decomposing tasks) –Adequate information system among partners
Contracting	–Well defined contracts among identified partners –Long-term contracts or frequently renewed short term contracts –Deliberate incomplete contracts in case of uncertainties linked to specific assets (possible adjustments and re-negotiations, people usually in charge of adaptation and solving of conflicts)
Competing	–Importance of competitive pressure (internally but also externally with the other organizational forms) –Risk of individual opportunistic behaviors or migration of partners from one organizational form to another leads to the implementation of internal mode of regulation and control

2.2.3. A New Institutional Economics Theory Approach

Another way to provide a detailed definition of different organizational forms from an economic point of view is to use the new institutional economics theory (Williamson, 1985, 1991, 1996). The new institutional economics perspective focuses on institutional or organizational innovations as a way to organize certain transactions more efficiently: here, to carry out ecological compensation. Three main organizational forms coordinate transactions: markets (as defined above), hierarchies (command and control), or hybrid forms (combining features of markets and hierarchies). This paper focuses on hybrid forms since they seem to be the most appropriate way to describe the mitigation banking system.

According to Ménard (2004, p. 351), hybrid forms “rely on partners who maintain distinct property rights and remain independent residual claimants”. Even if they are diverse, they show recurrent empirical regularities: pooling resources, contracting and competing (Table 2). Hybrid forms have a particular combination of market and hierarchy characteristics that makes them better adapted to the characteristics of the transactions they are aimed at organizing.

Thus, we have three criteria to define a market from the new institutional economics theory approach.

3. Results and Discussion

3.1. Functioning of the Wetland Mitigation Banking System in Florida

The mitigation banking system is based on the Clean Water Act (CWA), which requires compensation for impacts on wetlands in order to reach a goal of no net loss of this type of ecosystem in the United States (Hough and Robertson, 2009). The normative aim of no net loss is to reach equivalence between ecological function losses and gains. In Florida, actors are under the obligation to fulfill the requirements of ecological compensation at the federal level (United States Army Corps of Engineers (USACE)), and at the state level (Florida Department of Environmental Protection (FDEP) or Water Management Districts (WMD)).

Mitigation credits are defined on a biophysical nature basis (palustrine¹ emergent credits or estuarine credits for instance), and are determined by using assessment methods. Credits correspond to the extent of biodiversity loss caused by the developers and to the extent of biodiversity gain produced by a mitigation banker. The debt of the developer is expressed in mitigation credits that have to be bought from mitigation bankers who own mitigation credits approved by regulators. The geographic area within which mitigation credits can be traded is physically demarcated by a service area defined on the basis of hydrographic criteria.

¹ Terrestrial wetlands that are not under tidal influence.

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