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Estimating Transaction Costs of REDD+

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ABSTRACT

Reducing emissions from deforestation and forest degradation (REDD+) is generally believed to be a cost-effective mitigation strategy against climate change. Some suggest, however, that costs of REDD+ are underestimated because many studies either exclude or undervalue transaction costs. A major challenge in this field of research is the absence of a common framework and methodology for assessing such costs. This paper uses the notion of governance structures to suggest a generic definition and methodology for measuring transaction costs. The methodology is subsequently used in an analysis of transaction costs for REDD+ pilots in RDS Rio Negro, Brazil and Kilosa, Tanzania. Results indicate higher unit costs – costs per ton of reduced CO_2 – of establishing the REDD+ governance structures in Kilosa, while unit costs of using those structures are higher in RDS Rio Negro. The results also show that while REDD+ was originally conceived as a market i.e., a direct trade between buyers and sellers, it could also take on a non-market governance structure or a mixture of market and non-market elements. These different forms of governance structures have implications for transaction costs.

1. Introduction

There is widespread support among economists for the idea that reducing emissions from deforestation and forest degradation (REDD+) is a cheap mitigation strategy when compared to other options (e.g., Stern, 2007). Yet, while cost-effectiveness or efficiency is at the heart of REDD+ policy, there is concern that cost studies rarely give a complete coverage of all costs[1] involved, because most either exclude or underestimate transaction costs (Fosci, 2013; Pearson et al., 2013; Rakatama et al., 2017).

In empirical work, the concept of transaction costs has been widely applied to public policies (Wang, 2003). With specific reference to environmental policy, transaction costs are believed to be relevant for the design and selection of policies (Paavola, 2002; McCann, 2013) Even then, economists still grapple with the basic conceptual aspects of transaction costs, particularly what they are and how they should be measured (Wang, 2003). Since there is considerable variation in the methods and definition of concepts used in empirical analyses, it is difficult to compare across studies (Dawkins, 2000; Antinori and Sathaye, 2007), which complicates the task for policy makers to select between competing policies.

In this paper, we suggest that a possible reason for the ambiguity in transaction cost measurement is that transactions are so diverse and operate in a wide variety of circumstances. The aim of the paper is therefore to suggest a definition of transaction costs that can be used across different contexts. Based on that, we present a methodology for measuring these costs and exemplify it using data from two REDD+ pilots in Brazil and Tanzania. Our focus is on transaction costs for REDD+ at the local level, but the methodology developed should also be relevant for analyses at other levels as well as fields of study outside REDD+.

2. Defining Transaction Costs

2.1. A Complex Field of Definitions and Perspectives

Conceptualization of transaction-cost traces back to Coase who argued – in sharp contrast to conventional environmental economics at the time – that carrying out market transactions carries costs (Coase, 1937). Commenting on Pigou (1920), Coase further argued that if market transactions were costless, assigning private property rights was enough to trigger private trades, through which victims of pollution would price out the polluters and ultimately lead to the elimination of environmental problems. However, because market transactions do in fact entail costs, resource allocations may sometimes need to be resolved through means other than markets including government

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[1] The costs for REDD+ can be divided in three categories. They include opportunity costs – the value foregone from alternative land use – production costs – costs of activities that directly lead to increase in forest carbon storage like gap filling and nursery establishment – and transaction costs.

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regulations, taxes, subsidies, standards (Coase, 1960; Dahlman, 1979).

Although Coase's contributions have been greatly influential across a variety of economic disciplines, they have also been a source of tremendous controversy and diversity in interpretation (Allen, 1999; Wang, 2003). At the root of the problem are the two dominant schools – the neoclassical and the new institutional economics positions. The standard neoclassical model assumes zero transaction costs and private property rights for all goods. Further, property rights are always completely defined, allocated and enforced (De Alessi, 1983). Hence, neoclassical scholars have typically omitted transaction costs from analyses. Yet, there is currently wide acceptance also among neoclassicals that trading carries costs, and as a result a recognition that property rights may sometimes be incomplete. Increasingly, therefore, analyses do treat the subject of transaction costs (and their links with property rights). When included, however, this tradition deals with the two concepts only in the context of trade. Thus, transaction costs would typically be defined as costs that occur in the transfer of property rights between firms or individuals through market exchange (e.g Demsetz, 1964; Niehans, 1987). Further, cost categorization is based on activities aimed at overcoming imperfect information and uncertainty in market exchanges. Examples include search, approval, negotiation/bargaining, decision-making, insurance, monitoring and enforcement costs (Stavins, 1995; Dudek and Wiener, 1996). Therefore, only costs which are external to market participants are relevant. Internal costs such as administrative or enforcement costs within firms are not considered (Allen, 1999).

The approach of new institutional economics expands beyond focusing only on trade to include also costs of command within hierarchies like firms, public entities, and households (Pollak, 1985; Williamson, 2000). When analyzing the costs of market exchange, for example, studies consider both participants' external costs of overcoming imperfect information and internal costs of organizing trade (as long as they are not costs of production) as transaction costs (e.g., Wallis and North, 1986). A typical definition in the new institutional tradition would be the costs of defining and maintaining property rights (Allen, 1999; McCann et al., 2005). According to this literature, all aspects of allocating property rights are costly. Markets may not always be the option with least transaction costs. Therefore, the goal of analysis is to decide which governance structure should be chosen based on the criteria of economizing most on transaction costs – i.e., efficiency (Williamson, 1981; Dawkins, 2000).

The new institutional school has found a considerable audience among scholars of society and economics. This is understandable because by widening the scope of transaction cost analysis and including broader forms of property rights and other institutions (North, 1992), new institutional economics circumvents some shortcomings of the neoclassical paradigm. Nevertheless, it maintains core aspects of this approach (Eggertsson, 1990), particularly the rational choice model (Gsottbauer and van den Bergh, 2011). Within this individualist-utilitarian ideology, policy prescriptions always gravitate towards welfare-based solutions – minimizing cost and maximizing benefits.

For those of us concerned with transaction costs, this is problematic, not least in the context of environmental policy. One issue regards the extent to which one could rely on efficiency as the only criterion for the selection and design of policies (Dawkins, 2000), when it is increasingly understood that equity, effectiveness and legitimacy may be equally important (Colby, 2000; Buitelaar, 2004; Vega and Keenan, 2014). A related concern is that institutional economists have conceptualized determinants of transaction costs (asset specificity, frequency, and uncertainty) within a market context (Williamson, 1985). We observe, however, that analysts have had to adjust this framework in order to cater to the unique aspects of environmental goods and to explain better what influences transaction costs in arrangements that deviate from 'pure' markets (Ruiter, 2005; Antinori and Sathaye, 2007; Rørstad et al., 2007; Coggan et al., 2010; Coggan et al., 2013; McCann, 2013; Phan et al., 2017).

So, due to the 'rather uneasy' extension from neoclassical to new institutional economics, there is considerable ambiguity and inconsistency regarding the transaction cost concept, which has made it extremely difficult to compare results, as different studies include or exclude different types of costs as well as include or exclude different types of transactions. Perhaps an all-encompassing framework would help resolve the issue.

2.2. Transaction Costs as Costs of Establishing and Using Governance Structures

From the above, we observe that the definition of transaction costs varies because of different system delimitations – i.e. what kind of human interactions that are included. Progress towards a shared definition demands a common platform with a delimitation of transaction costs that captures all types of transactions that are relevant for economic activities. We find that the conceptual framework of a governance structure serves such a purpose. A governance structure (GS) may be defined as consisting of:

a) the actors involved – e.g., individuals, communities, public bodies/agencies, firms, non-governmental organizations (NGOs) or intergovernmental organizations (IGOs) – with different forms of rights and responsibilities.
b) the institutions defining the rights and responsibilities of these actors and facilitating the interactions between them (Vatn, 2015).

Actors may interact in different ways. We have already noted trade and command. Actors may however also donate, cooperate or reciprocate. Taken together, there may be numerous governance structures – hence, forms of transactions (Vatn, 2010, 2014). When there is direct interaction between producers and buyers in the form of trade, the resulting governance structure is the simplest form of a market – see GS1 in Fig. 1. However, producers and buyers often do not interact directly. We observe intermediaries such as wholesalers and brokers. In this case, the resulting governance structure would often be a series of trades – see GS2c. However, also public bodies and NGOs could act as intermediaries. Then we may face a mix of market and non-market elements as in GS2a, or purely non-market transactions as in GS2b.

The actors involved are defined by their rights and responsibilities. Rights to resources – property or use rights – are important aspects. Various responsibilities are typically also defined and exist as characteristics of actors. Some of these structures are formal while others are informal. Both kinds are important when characterizing actors.

While the above emphasizes economic interactions, governance also regards political interactions – i.e., the transactions, which define rights and responsibilities in the economic sphere. They cover public monitoring, enforcement, and litigation. They also cover contracting of government services to private actors or civil society actors (Moe, 1990). They finally regard establishment of political actors, electing leaders/political bodies and the interactions between different levels of public leadership – e.g., the state, district, municipal, village council, clan leaders etc. (Vatn 2015). There are also transactions among civil society and between civil society and political actors regarding dissemination of information, political debate, advocacy or mediation.

2.3. Operationalization of the Framework

Based on the above, and in agreement with Marshall (2013), we define transaction costs as the costs of establishing, maintaining, changing and using a certain governance structure.

We thus propose a framework that distinguishes between two broad cost categories: 1) costs of developing and 2) costs of using a governance structure. The first category encompasses establishment, maintenance and change costs of actors and institutions comprising the governance structure. These costs arise out of activities such as