



Methodological and Ideological Options

Determinants of conservation among the rural poor: A charitable contribution experiment

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ABSTRACT

This paper examines how conservation decisions are affected by environmental degradation. Donations to an environmental NGO and participation in actual conservation activities capture individual preferences for environmental conservation. Environmental degradation is measured both through survey-based data on experiences of deforestation and environmental shocks, and through indices of deforestation constructed with GIS data. The results show that being exposed to environmental degradation is correlated both with higher donations and conservation behavior. The relationship between conservation choices and individual social preferences is also explored. Experimental measures of individual altruism and inequality aversion, and survey measures of trust, time preferences and civic engagement are correlated with donations and real world conservation decisions respectively. These findings show the role of environmental awareness in fostering environmental conservation even in very poor settings. They also highlight the potential of experiments, which closely mirror real world decisions, to generate conclusions generalizable to individual behavior outside the laboratory.

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1. Introduction

Promoting sustainable use of natural resources is one of the main challenges facing policy makers in developed and developing countries alike (Millennium Ecosystem Assessment, 2005; TEEB, 2010). While developed countries adopt laws and sanctions to regulate the use of common property resources (henceforth CPR), developing countries often lack the institutional capacity to design and enforce the complex measures to address environmental problems (Dietz et al., 2003). Sustainable management of natural resources in poor countries often relies on informal systems managed by users themselves (Wade, 1987). Given the role of collective action in promoting sustainable resource use in these settings, understanding what influences environmental valuation and generates support for locally owned solutions is a priority both for policy makers and researchers (Agrawal, 2001; Gibson et al., 2005).

Research on these issues can have a large impact on development and poverty reduction. The negative consequences of environmental degradation are likely to be more severely felt in poor countries (Mendelsohn et al., 2006; Stern, 2006). Heavier reliance on fresh water, pastures, and forests, for example, results in greater vulnerability to environmental shocks, such as flooding, droughts and soil erosion (Morton, 2007). Research shows how environmental degradation in general, and deforestation in particular, affect those who rely on natural resources for their livelihoods (Bucknall et al., 2000). Such negative effects are stronger among more vulnerable family members, such as children (Nankhuni and Findeis, 2004). Long firewood collection time may also expose the female population of a developing country to danger in conflict zones (Bizzarri, 2009).

This paper examines factors associated with individuals' choices to contribute to environmental conservation in rural Sierra Leone. We focus on two potential correlates of conservation behavior: social preferences and exposure to environmental degradation. First, through an artefactual field experiment (Harrison and List, 2004), which closely mirrors actual conservation decisions faced by participants in their daily lives, and survey measures of actual conservation behavior, we analyze the relationship between environmental conservation and other types of social preferences, measured using experimental and survey data.

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Second, we examine the correlation between conservation choices and indices of environmental degradation, both collected through survey questions and constructed from GIS deforestation data.

Conservation behavior is defined here as the preservation and management of the environment and common natural resources. Consequently, our dependent variables – donations to a conservation NGO, participation in town cleaning and maintenance of the village's water sources – capture actual conservation behavior. Participants to the experiment decide how much to donate to a local NGO conducting environmental education and conservation campaigns in the country. We complement this experimental measure with survey data on two real world conservation activities: town cleaning and maintenance of public water sources. These activities are common practices among sample villages, where community members get together to clean common spaces and protect them from contamination by animals. The three dependent variables used in this study differ not only in the method used to collect them, but also in their relation to environmental conservation more specifically, rather than to social preferences and civic engagement more broadly.

The paper is articulated as follows. First, we discuss the relevant literature on CPR management and review factors associated with more effective management systems (Section 2). We then give an overview of the study design, data, and empirical strategy (Section 3). We present and discuss the empirical results in Sections 4 and 5, respectively. Section 6 concludes.

2. The Common Pool Resource Problem

CPR are characterized by non-excludability and rivalry in consumption. The difficulty of excluding individuals from use, combined with the fact that consumption by one individual reduces the amount of resources available to others, imply that CPR users face a typical cooperation dilemma. Each individual depends on the resource for her livelihood and has the incentive to maximize her own benefit by increasing extraction. However, if everyone follows the same rationale, the resource will be depleted and will not generate benefits for anyone in the long term. In an influential article, *Hardin (1968)* claims that the behavior of rational, self-interested individuals is bound to result in overexploitation of CPR. This conclusion is consistent with game theoretical predictions and is confirmed by numerous examples of overharvesting of renewable natural resources, such as fisheries, forests and groundwater.

A large literature on CPR management questions this vision, by offering evidence of effective cooperation to solve problems related to the commons. Field experiments show that collective action is most effective when communities are able to self-organize, and design and enforce their own rules (*Baland and Platteau, 1996; Ostrom et al., 1999; Wade, 1987*). Among the factors influencing the effectiveness of CPR management is environmental degradation. The relationship between conservation and degradation is complex: while overexploitation of natural resources leads to environmental degradation, a certain degree of resource degradation is necessary to trigger collective action for conservation. Among the different types of resource attributes that contribute to self-organized forest management, *Elinor Ostrom (1999)* underscores the importance of feasible improvement. Feasible improvement refers to a resource that is “not at a point of deterioration such that it is useless to organize or so underutilized that little advantage results from organizing”. Empirical evidence shows that cooperation levels are low when the CPR is either abundant or extremely degraded, but high when the level of degradation is at a moderate level (*Bardhan, 2000*).

Dependence on the CPR for a major portion of one's livelihood is also claimed by *Ostrom (1999)* to be a factor leading to greater interest in conservation of the resource. Empirical evidence from Malawi shows that, where forests serve as safety nets for people, individuals have higher rates of participation in CPR management (*Jumbe and Angelson, 2007*).

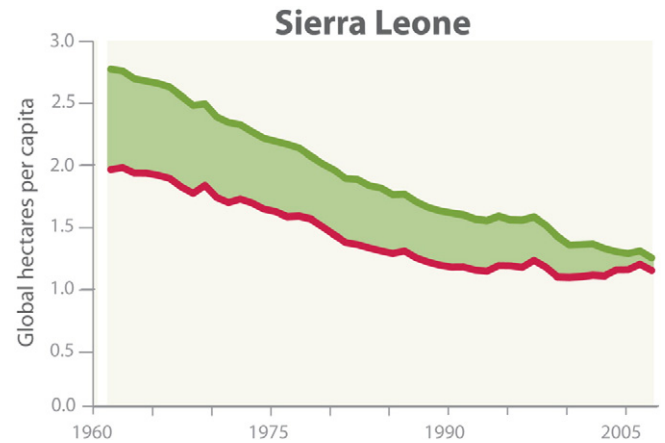


Fig. 1. Ecological footprint (red) and biocapacity (green) of Sierra Leone, 1961–2007. Note: The ecological footprint of production represents the rate of resource extraction and waste generation; biocapacity represents the rate of resource re-generation and waste sequestration. A situation where the Ecological Footprint exceeds biocapacity indicates that domestic resources may be degraded. Sierra Leone seems to be approaching this point, and may cross it within a few years if there are no conservation efforts (*Ewing et al., 2010*).

Social preferences, such as altruism, inequality aversion, trust, time preferences and civic engagement, are likely to affect CPR management since they shape individuals' response to the trade-offs between individual and social benefits from environmental conservation. Their role is bound to be particularly relevant in developing country settings, where social norms often substitute for formal institutions lacking regulatory and enforcement capacity (*Narayan, 1999; Khan, 2006*). The empirical evidence on the relationship between social preferences and environmental conservation widely supports this view (*Goeree et al., 2002*). In particular, an individual's level of altruism is likely to be positively correlated with her contribution to a local public good because an altruistic person's utility is a positive function of others' consumption. This view is in contrast with the traditional notion of self-interested individuals, whose utility depends solely on one's own consumption (*Becker, 1976; Collard, 1978; Reece, 1979*).

Preferences for fairness are also likely to foster sustainable management of CPR through their influence on people's willingness to contribute to public goods and to punish overexploitation by others. Direct evidence on the link between inequality aversion and public good contribution is scarce, but research in psychology (*Bégué and Hafer, 2005; Lerner, 1980*) and economics (*Andreoni et al., 2003*) shows that people express their preferences for fairness by punishing inequality in resource allocation.

The literature on social capital and collective action identifies trust as a necessary condition for cooperation within a society (*Cramb, 2005; Ostrom, 1998; Pretty, 2003; Pretty and Smith, 2004*). Experimental studies show the presence of a positive correlation between trust towards strangers, contributions to public goods (*Gächter et al., 2004*) and other social preferences, such as fairness (*Walker and Ostrom, 2007*). Field evidence supports the results from laboratory experiments: combining data from a trust game with information on investments in soil and water conservation, *Bouma et al. (2008)* find a positive and significant correlation between the amount sent in the trust game and participation in CPR management.

Investing in conservation involves a trade-off between short term costs and uncertain returns in the future. The degree to which individuals discount the future is therefore likely to affect the perceived benefits from contributing to natural resource conservation. The evidence on whether the poor discount the future more heavily, and on how discount rates translate into conservation activities, is mixed. In a

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