



Surveys

Compensation and Rewards for Environmental Services (CRES) and efficient design of contracts in developing countries. Behavioral insights from a natural field experiment



Sophie Clot ^{a,*}, Fano Andriamahefazafy ^b, Gilles Grolleau ^{a,c}, Lisette Ibanez ^d, Philippe Méral ^e

^a Montpellier SupAgro, LAMETA, UMR 1135, 2, place Pierre Viala, 34060 Montpellier, France

^b C3ED-Madagascar, Université d'Antananarivo, Madagascar

^c LESSAC, Burgundy School of Business, 29, rue Sambin BP 50608, 21006 Dijon, France

^d Institut National de la Recherche Agronomique, LAMETA, UMR 1135, 2, place Pierre Viala, 34060 Montpellier, France

^e Institut de Recherche pour le Développement, UMR GRED, 911, avenue Agropolis BP 64501, 34394 Montpellier, France

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ABSTRACT

The use of economic incentives for biodiversity (mostly Compensation and Reward for Environmental Services including Payment for ES) has been widely supported in the past decades and became the main innovative policy tools for biodiversity conservation worldwide. These policy tools are often based on the insight that rational actors perfectly weigh the costs and benefits of adopting certain behaviors and well-crafted economic incentives and disincentives will lead to socially desirable development scenarios. This rationalist mode of thought has provided interesting insights and results, but it also misestimates the context by which 'real individuals' come to decisions, and the multitude of factors influencing development sequences. In this study, our goal is to examine how these policies can take advantage of some unintended behavioral reactions that might in return impact, either positively or negatively, general policy performances. We test the effect of income's origin ('Low effort' based money vs. 'High effort' based money) on spending decisions (Necessity vs. Superior goods) and subsequent pro social preferences (Future pro-environmental behavior) within Madagascar rural areas, using a natural field experiment. Our results show that money obtained under low effort leads to different consumption patterns than money obtained under high efforts: superior goods are more salient in the case of low effort money. In parallel, money obtained under low effort leads to subsequent higher pro social behavior. Compensation and rewards policies for ecosystem services may mobilize knowledge on behavioral biases to improve their design and foster positive spillovers on their development goals.

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1. Introduction

Compensation and reward mechanisms are frequently used in environmental mitigation policies. The underlying idea is quite straightforward: in exchange for an environmental service (e.g. fencing land to protect watersheds, stopping cultivation to increase natural areas), individuals receive an incentive to offset foregone income, which could take the form of money, training, in-kind compensation, etc. These policies are based on the insight that rational actors perfectly weigh the costs and benefits of adopting certain behaviors, and that well-crafted economic incentives and disincentives will guide people to adopt socially desirable technologies and behaviors. This rationalist mode of thought has yielded interesting insights and results, but it also underestimates the context by which 'real individuals' come to decisions, and underestimates the multitude of factors shaping decision making.

In the context of developing countries, Compensation and Rewards for Environmental Services (CRES) are worthwhile for several reasons. To start with, developing countries often contain the largest parts of tropical forests, which have the potential to provide several ecosystem services through species conservation, climate regulation, watershed protection, carbon sequestration, as well as pure esthetic benefits. Because developing countries characteristically face high rates of poverty, the possibility of a win-win solution that would enable both poverty alleviation and environmental conservation makes CRES mechanisms especially appealing to policy makers, program designers, and researchers.

When policy mechanisms are conferred so many positive attributes, however, their side effects can often be overlooked. As noted in Muradian et al. (2013) and Kinzig et al. (2011, 2012), over-reliance on win-win solutions might lead to ineffective outcomes similar to those experienced with earlier integrated conservation and development projects. In this research, we use behavioral economics to bring to light potential biases that might interact with tools designed for environmental

* Corresponding author.

E-mail address: clot@supagro.inra.fr (S. Clot).

conservation and impact (either positively or negatively) overall spillovers. Indeed, behavioral economics reveals that our intuitions about the drivers of behavior are sometimes flawed, notably because decision-making and behaviors are largely context-dependent (Dolan et al., 2012). Our goal is not to evaluate the effectiveness of incentive-based policies but to examine how these policies can take advantage of some unintended behavioral reactions that might in turn impact the performance of environmental policies by examining the differences between 'Econs' (i.e., the fully rational agents of economic textbooks) and 'Humans' (i.e., real individuals in real-world settings) (Thaler and Sunstein, 2008).

Our contribution examines two behavioral biases defined as systematic and predictable deviations from the rational model of human behavior (Kahneman, 2003). The first bias, termed "mental accounting," studies the impact of income source on individuals' consumption decisions. The hypothesis behind mental accounting is that the way you obtain money impacts the way you spend it, due to the fact that it transits through separate accounts (e.g. the same \$100 won't be spent the same way if you found it on the street vs. if you earned it by working, even if the value of the income gain is exactly the same). It is clear that this bias may have implications related to compensation mechanisms, and we analyze whether money received from a working activity is more likely to be placed in a regular account and treated with a high level of responsibility (i.e. utilitarian consumption) compared to money received as a reward involving less effort than the original activity, which would be more likely to be treated impulsively (i.e. self-indulgent, luxurious consumption). Specifically, we test whether the level of effort involved in earning money impacts subsequent economic behavior. If this is the case, designers of CRES programs may wish to strategically utilize compensation in the form of earnings vs. rewards in order to more effectively foster economic development.

The second bias, termed "moral licensing," studies the behavioral adaptation (i.e. moral compensation) that may take place when environmental conservation is morally oriented. It refers to a situation where doing something morally respectable in a first stage excuses the individual from adopting morally dubious behavior afterwards. We therefore question the potential counterbalancing effect of rewards (i.e. promoting moral behavior) on subsequent prosocial motivation.

1.1. Compensation and Mental Accounting Bias. Is One Dollar Always Valued in the Same Manner?

Compensation and Rewards for Environmental Services (CRES) are defined as "Contractual arrangement and negotiated agreements among ecosystem stewards, environmental services beneficiaries, or intermediaries, for the purpose of enhancing, maintaining, reallocating or offsetting damage to environmental services" (Swallow et al., 2009). This definition covers a wide array of cases depending on the ecosystem services provided (watershed protection, carbon sequestration, biodiversity conservation, etc.) and the contract's scheme (degree of implication and type of work requested,¹ cash vs. in-kind compensation, direct vs. indirect payment, temporality of installments, etc.). In this work, we focus on the latter aspect, payment scheme and degree of work implication. We explore the behavioral impact of the level of effort (i.e. amount of work) involved in the compensation mechanism, since it may significantly differ from the level of effort required by more traditional land use.

The level of effort required depends on the program. While some contracts strive for the adoption of a sustainable management plan or engagement in reforestation, others seek exclusively conservation. For instance, watershed protection strategies include cases where upstream communities are compensated in exchange for protecting forests and

reducing their activity near to the river bank (Pagiola et al., 2008). In carbon sequestration programs, farmers are compensated to stop cutting trees (Börner et al., 2010). In some biodiversity conservation projects, payments are offered in exchange for refraining from hunting and limiting the expansion of crops and livestock on given lands (Frost and Bond, 2008).

Most research issues relate to the methods used to estimate the monetary amounts that are at least equal to landowners' opportunity costs (Wunder, 2008; Pagiola et al., 2005), but little attention has been given to how those payments are integrated into farmers' budgets. Under the traditional hypothesis of money fungibility, such payments should be simply treated in the same way as traditional land use income.

Meanwhile, however, research in anthropology, psychology, and behavioral economics suggests that human reactions to economic instruments may differ from those predicted by traditional economic models of rational choice. In sum, as explained by Thaler and Sunstein (2008), 'Humans' do not behave as 'Econs'. More specifically, a body of research exists that shows that money is not in fact treated as fungible by human beings. A reconsideration of the fungible money principle led a group of researchers to establish a theory of mental accounting (Kahneman and Tversky, 1984; Thaler, 1990, 1999), which posits that people value money differently depending on how the money is obtained, and as a result, class it into different categories. Such accounts would be meaningless if they were perfectly fungible, but experimental evidence shows that the way you obtain a payment or in-kind reward determines the way in which you subsequently use it.

For instance, research on prostitutes in Oslo demonstrated that they spend the money they earn from clients differently than the money they receive from the government. Whereas money from the government is typically used to spend on rent or food, money from their clients is more often used to party (Sager, 2010). In Kenya, indigenous tribes scrupulously differentiate between categories of money. Income from selling lands cannot be used to buy cattle, otherwise it is believed that the entire herd of cattle would die (Shipton, 1990).

Mental accounting in developing countries remains widely underexplored. The absence of studies in the natural context (i.e. outside of the lab) casts further doubt upon the external validity of existing mental accounting studies. Will money (or in-kind compensation) that farmers receive in exchange for stopping work on their lands be used similarly compared to money they obtain directly from working their land? Is a dollar earned from conserved land used in the same way as a dollar earned from cultivated land? This is one of the main questions we address in this work. Using a natural field experiment in a developing country context, we test how two different ways of obtaining income influence subsequent consumption behavior.

Our experimental intention is to compare individuals' choices between necessity vs. superior (i.e. luxury) goods, after having received payments obtained from either little effort or from work. To the best of our knowledge, this is the first natural field experiment to test the impact of income sources on spending behavior. Despite the fact that they may directly impact policy performance, the implications of the mental accounting bias are understudied in the context of developing countries.

1.2. Rewards and Moral Licensing Bias. Do Good Deeds Make Bad People?

Rewards aim to promote 'good behavior' by selectively compensating desirable actions. Furthermore, they are characteristically embedded in a moral dilemma frame, wherein good deeds interact with bad deeds. In this context, environmental conservation becomes something 'good'. We can distinguish between two kinds of rewards: financial rewards and non-financial rewards. For instance, previous research has demonstrated that financial rewards can crowd out pre-existing intrinsic motivation (Frey and Jegen, 2001; Bénabou and Tirole, 2006). Non-financial incentives have also attracted increasing research interest

¹ Land conservation, land reforestation, sustainable management plan, etc.

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