A human-centered framework for innovation in conservation incentive programs

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Abstract The promise of environmental conservation incentive programs that provide direct payments in exchange for conservation outcomes is that they enhance the value of engaging in stewardship behaviors. An insidious but important concern is that a narrow focus on optimizing payment levels can ultimately suppress program participation and subvert participants' internal motivation to engage in long-term conservation behaviors. Increasing participation and engendering stewardship can be achieved by recognizing that participation is not simply a function of the payment; it is a function of the overall structure and administration of the program. Key to creating innovative and more sustainable programs is fitting them within the existing needs and values of target participants. By focusing on empathy for participants, co-designing program approaches, and learning from the rapid prototyping of program concepts, a human-centered approach to conservation incentive program design enhances the propensity for discovery of novel and innovative solutions to pressing conservation issues.

Keywords Adaptive governance · Design thinking · Human-centered design · Incentive programs · Participation · Stewardship

INTRODUCTION

The allure of integrating financial incentives into environmental conservation programs stems from the simplicity with which the societal goals of environmental protection can be aligned with individual outcomes through direct payments (Van Vugt 2009; Ferraro 2011). Financial incentives, such as payment for ecosystem services (PES) programs or conservation performance payments, have become increasingly common over the past decade both in

developed and developing countries (Wunder et al. 2008; Milne and Niesten 2009). These conservation programs are particularly attractive because of their low transaction costs, outcome-based nature, and the potential opportunity to combine livelihood improvement and poverty alleviation efforts with biodiversity conservation programs (Ferraro and Kiss 2002). Design of environmental incentive programs to date has largely focused on the needs and concerns of the provider and issues such as efficiency, optimal pricing, and additionality (e.g., Sommerville et al. 2009; Banerjee et al. 2013). We believe that a greater focus on the user is needed to maximize program success. Failure to explicitly incorporate potential participants' needs can lead to two suboptimal outcomes: (1) participation will not be sufficient to ensure landscape-level outcomes, and (2) individuals will be less likely to integrate conservation behaviors into their stewardship ethic and continue those behaviors once the program ends. We present a framework for integrating external motives (payments) and internal motives (stewardship) in a way that can lead to more durable behaviors and successful conservation incentive programs.

THE HIDDEN COSTS OF FINANCIAL INCENTIVES

Although direct payments are often a necessary or strategic component of conservation programs, financial incentives can have a number of hidden costs that have been well documented in the social sciences. These costs, however, are often underappreciated by program designers. Financial incentive programs rely heavily on the price effect, whereby individuals systematically change their behavior in response to financial rewards for doing so. From this viewpoint, obtaining a desired behavior is simply a matter

of getting the price right: the main challenge is determining an efficient pricing scheme. This perspective, however, relies on the imperfect assumption that the targeted audience is driven exclusively by economic self-interest. In reality, potential participants simultaneously consider other aspects of conservation incentive programs, including land-use restrictions, technical assistance, time period, regulatory assurances, decision-making latitude, and perceived efficacy (Langpap 2006; Sorice et al. 2013; Sorice and Abel 2015). Social forces, such as social norms and networks, can also play an important role (Sorice et al. 2011). Because individuals consider outside social forces and non-financial components of environmental incentive programs, a focus solely on payments is likely to be insufficient to stimulate the widespread participation needed to precipitate landscape-level environmental benefits (Muradian et al. 2010).

Environmental stewardship reflects an ethic that explicitly incorporates helping behaviors that embody an individual's awareness for the interconnectedness between their own behavior, the behaviors of others, and environmental impacts (Leopold 1949; Worrell and Appleby 2000). For example, the relationship between stewardship behaviors focusing on biodiversity and the subsequent outcomes are often spatially and temporally disconnected, making it difficult for an individual to attribute a conservation outcome directly to their own stewardship behavior. Thus, a biodiversity stewardship ethic tends to be internally motivated (i.e., to “do the right thing”) rather than externally driven (i.e., for a reward). These internally driven stewardship behaviors related to biodiversity and environmental conservation are susceptible to being undermined by financial incentives (Frey and Jegen 2001). Although the price effect assumes that behavior adjusts to changes in relative prices producing a shift toward less costly options, the financial payment can “crowd out” an individual's internal motivation by shifting one's perception of their behavior as being externally controlled rather than internally driven.

This crowding out of internal motivation can lead to lower effort than might otherwise be achieved if internal motivation was driving stewardship behavior. Individuals may expend no more effort on a task than is minimally required by an incentive agreement (Heyman and Ariely 2004; Bowles 2008). Relatedly, financial incentives also can create the perception that it is the duty of someone else (e.g., government or NGO), rather than the individual, to contribute to the provision of biodiversity or ecosystem services. For example, a PES program in Cambodia with low administrative costs and high payments failed to achieve goals such as building local skills or understanding of conservation goals that might lead to durable environmental behaviors (Clements et al. 2010).

Once a transformation from an internal to an external motivation has occurred, it can be difficult to reverse (e.g., Heyman and Ariely 2004; Vohs et al. 2006). Program participants who engage in a conservation behavior solely to obtain a financial reward may be more unlikely to continue the behavior once the payment is removed. Alternatively, individuals may require increased payments through time or may even engage in strategic, but perverse, behavior to obtain greater compensation (e.g., allowing species habitat to degrade to create a financial opportunity to restore it) (Deci et al. 1999; Jack et al. 2008).

At least in some circumstances, the hidden costs of financial incentives can be expected to lead to reduced, temporary, or even perverse environmental behaviors. This risk may not be a concern if policy makers recognize a priori that this transformation of motives from a moral exchange to a market exchange is a resilient new stable state and likely requires perpetual funding. If, however, the ultimate goal is for individuals to continue environmentally beneficial behaviors in the eventual absence of financial compensation, then programs should be designed carefully to integrate any existing or latent stewardship ethic that is present in the target population.

ALIGNING FINANCIAL INCENTIVES AND ENVIRONMENTAL STEWARDSHIP

Program structure and delivery are important but overlooked elements that influence participation. An individual will opt into an incentive program only after coming to some conclusion about the benefits offered relative to the costs—a decision that takes into account all aspects of a program. Yet, financial incentives for such participation are typically operationalized within programs that have unattractive conditions for many potential participants, such as long contract lengths, lack of assurances, reduced flexibility, or restrictions on livelihood activities (Sorice et al. 2013). Understanding and incorporating potential participants' perceptions and needs into the design of incentive programs can help mitigate potential hidden costs, and ultimately lead to increased participation (Donlan 2015). Doing so can also minimize the possibility of financial incentives crowding out intrinsic motivation (Frey and Jegen 2001). When individuals perceive an incentive program as supportive rather than controlling, the perception of personal causation can remain a primary driver of behavior. In such cases, an environmental stewardship ethic is more likely to be engendered or sustained in parallel with any financial payment because the payment is viewed as removing a barrier to participation. This perception of support, however, comes exclusively from non-financial aspects of the program.

Behaviors perceived to be internally motivated are likely to be sustained over time because the individual engages in those behaviors more for their inherent rewards than to obtain an external reward or avoid an external cost. This internal motivation can be engendered when programs support user needs related to freedom and choice, feelings of effectiveness and mastery, and social connectedness with the administering institution (Ryan and Deci 2000; DeCaro and Stokes 2008). Programs designed and implemented to support a participants' freedom of choice, along with their quality and way of life, will increase the likelihood that individuals will view the desired behaviors as part of their personal identity. This perception will increase the prospect that the individual will internalize that behavior, leading to a self-sustaining motivation for stewardship (Osbaldiston and Sheldon 2003). From this perspective, understanding the values and needs of potential participants is critical to creating successful incentive programs. Yet, most conservation incentive programs today spend more effort understanding the needs of a species or for an ecosystem service than the needs and values of the potential participants.

A human-centered approach to program design begins by recognizing that the needs and values of the landowner may fundamentally differ from those of the program provider and conservation target (e.g., an endangered species). It strives to gain an in-depth understanding of the people for whom the program is hoping to generate value. The crucial first step in this program design approach is to understand the lived experience of the target group. For example, ethnographic research provides in-depth, comprehensive knowledge of a group's culture and value systems (Lett 1990), which can serve as a foundation for identifying the specific unarticulated needs of the potential participants. A conservation program design process that first understands what is culturally meaningful and appropriate can then explore how members of that group might undertake the journey from the discovery of the program, through enrollment, and to their exit from the program. This knowledge can generate innovative solutions that will improve the overall attractiveness and performance of incentive programs (Liedtka 2011). From forest landowners in the United States (Sorice et al. 2013) to artisanal fishers in Chile, the human-centered approach to program design can be applied universally across conservation issues and cultures. For example, practitioners are working with small-scale fishers in Chile to design a program where fishers create enforced, no-take protected areas within their territorial user rights management zones. They are combining focus group and survey methodologies to understand fishers' preferences for different program components, such as contract length, perceived benefits, and enforcement requirements (Gelcich and Donlan 2015).

Their proposed conceptual model explicitly incorporates human-centered design by emphasizing the iterative nature of the fisher needs assessment, as well as co-design of the incentive program.

Human-centered design (or design thinking) has become an integral part of product and service innovation in the design, engineering, and business sectors (Martin 2009; Liedtka 2011). Coming out of the product design field, design thinking has a rich track record of innovation: Palm V personal digital assistants, Oral-B toothbrushes, Apple Computer's iPod, and the Herman Miller Aeron Chair. More recently, designers have transitioned from improving product functionality to innovating entire systems to deliver products, services, and experiences. Human-centered design is now being applied to a variety of social issues: non-profits are using it to innovate new ways to provide low-cost health care in developing countries and governments are using it to design better public services, such as the Good Kitchen project which re-designed a senior citizen meal program in Denmark (Brown and Wyatt 2010; Scherfig et al. 2010). Yet, human-centered design is notably absent across the environmental conservation sector (Donlan 2015).

The tools and methodologies of human-centered design in the corporate arena integrate qualitative research (e.g., ethnography), co-creation processes with target consumers, and rapid prototyping to innovate durable and desirable solutions (Liedtka and Ogilvie 2011; Melles et al. 2011). From a conservation program perspective, human-centered design focuses on empathy for the program participant, and, for a moment, ignores the needs of the conservation target. Once individuals' needs are well articulated, participatory processes are employed to incorporate biodiversity conservation needs, and co-create the program structure with the participants. The program creation step relies on an iterative process in which program concepts are prototyped through small trials or experiments—rapid prototyping allows mistakes to be made faster and cheaper in order to improve a program prior to any major investments. This experimental approach is somewhat analogous to adaptive management; however, a rapid learning platform is iterated prior to program execution solely for the purpose of testing program design concepts (Liedtka 2011).

Human-centered design has much to offer to those working on conservation incentive programs. First, this design process has a greater potential to lead to innovation in program design and delivery than processes that focus on the needs of conservation targets or organizations. Second, a human-centered design approach will result in greater confidence that a program will fit the values, cultures, and needs of target participants. Third, the resulting program will be considered legitimate by the target group because it was created through collaboration. Fourth,

human-centered design creates facilitating conditions that support a stewardship ethic when payments are considered necessary in program design. These factors combine to create a program that will be better adapted to the local context, will better meet user needs, will provide real value to the users and the community, and ultimately lead to increased levels of participation.

CONCLUSION

Biodiversity conservation has a long history of investing heavily in understanding the natural history, behavior, and needs of imperiled species and ecosystems (Greene 2005). As programs that engage individuals and working landscapes in the provision of biodiversity and ecosystem services become increasingly common, so have calls for more rigorous natural science to enhance the scientific foundations and evaluate the conservation effectiveness of such programs (Naeem et al. 2015). However, as payment-based programs become more common for a range of ecosystem services, the same call for rigorous social science to understand participation across a diversity of socio-economic and cultural scenarios is needed.

Participation in conservation incentive programs is steeped in complexity, grounded by place, and occurs in different social, political, cultural, and economic contexts. Although some conservation issues have win–win solutions (e.g., Sorice and Conner 2010), many others may threaten individuals' values, livelihoods, and rights (Peterson et al. 2002). Given the complexity and heterogeneity related to program participation, designing incentive programs with a strict focus on payment levels and the conservation target's needs will result in insufficient participation, underwhelming support, and little environmental benefit. In the same way that many start-ups in the business world fail because they produce products or services that nobody wants, practitioners must design conservation incentive programs in which people want to participate. Human-centered design is a proven approach that encourages innovation and provides a means to create programs that are customized to the needs of the individuals whose behavior the program seeks to nudge.

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