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The role of fairness norms the household-based natural forest conservation: The case of Wolong, China

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ABSTRACT

The shadow of "the tragedy of the commons" with its popularized assumption of selfish individual behavior concerns policy-makers, and consequently the cooperative capability of local communities in common resource management is usually underrated. Nevertheless, here we propose a hypothesis, based on a game theory model, that the social norm of fairness rather than self-interest might motivate cooperation in natural resource conservation by discounting the utility gain from illegal logging at the cost of another household's subsidy loss. In Wolong Nature Reserve of China, a recent household-based natural forest conservation program has led to remarkable progress in protecting the habitat of giant pandas (*Ailuropoda melanoleuca*) with low monitoring pressure. We undertook experiments based on a one-shot Ultimatum Game to test the prevalence of the norm of fairness in the local communities. Most proposers in the experiments showed strong preferences for fair offers in spite of the responders' reluctance to reject low offers, and the result contradicted the expectation of pure self-interest. Taking into account the norm of fairness, the prediction of the model is consistent with the local performance of the household-based conservation policy. It highlights the potential of local social norms to facilitate participation and cooperation by the local community in common natural resource conservation.

1. Introduction

The model of *Homo economicus*, which has guided the mainstream neoclassical economics for a long time, assumes that people are narrowly self-regarding egoists (Gintis, 2000). In accordance with this view, the tragedy of the commons seems unavoidable as everyone struggles for his or her own interests and loses the game as a whole (Hardin, 1968). However, empirical case studies (Ostrom, 1998; Ostrom et al., 2002; Dietz et al., 2003) have repeatedly rejected the assumption of universal selfishness by suggesting that people have the capability to pro-socially cooperate with each other, thus giving the common goods game a happy ending. In these cases, members of a group usually conform to some social norms, i.e., informal public rules that shape the social behavior in a certain regular and observable pattern (Bicchieri, 2005). For instance, empirical experiments have shown that the social norm of fairness is widely held in human societies (Sanfey et al., 2003; Fehr and Fischbacher, 2004; Bicchieri, 2005; Henrich et al., 2005; Henrich et al., 2006; Dawes et al., 2007). When pro-social norms are strong enough to override self-interested motives, cooperation in common resource management could be self-enforced. As a result, social capital provides a possible route for sustainable management and governance of common natural resources (Pretty, 2003), and bounded rationality models might be of greater use in environmental research and policymaking (Venkatachalam, 2008).

In China, the central government has recently launched a national Natural Forest Conservation Program (NFCP) as a critical project for preserving ecosystem services (Wang et al., 2007). A household-based management policy has been implemented in some protected areas, where each household or group of households is assigned a patch of natural forest to monitor and receives a certain annual subsidy according to the contract if no illegal logging occurs within the patch. Local governments often intuitively assume that the material subsidy motivates the local households to enforce the forest monitoring, but the subsidy budget for conservation is usually insufficient to cover the cost of intensive monitoring (Liu et al., 2003). Nevertheless, some cases shed light on the deadlock. For instance, the household-based NFCP in Wolong Nature Reserve (Fig. 1), one of the largest giant panda (*Ailuropoda melanoleuca*) reserves, has so far worked effectively by improving conservation of the forests and panda habitat while keeping the monitoring intensity low. The evidence suggests that there could be something else at work other than the material incentives to enforce social cooperation in forest conservation (Ostrom, 2005). One of the potential factors that need to be studied is the social norm of fairness.

The objective of this study is to unveil the possible role the social norm of fairness could play in common natural resource conservation. We first modeled the household behavior in the NFCP to analyze the potential impact of the fairness norm on the equilibria and dynamics of

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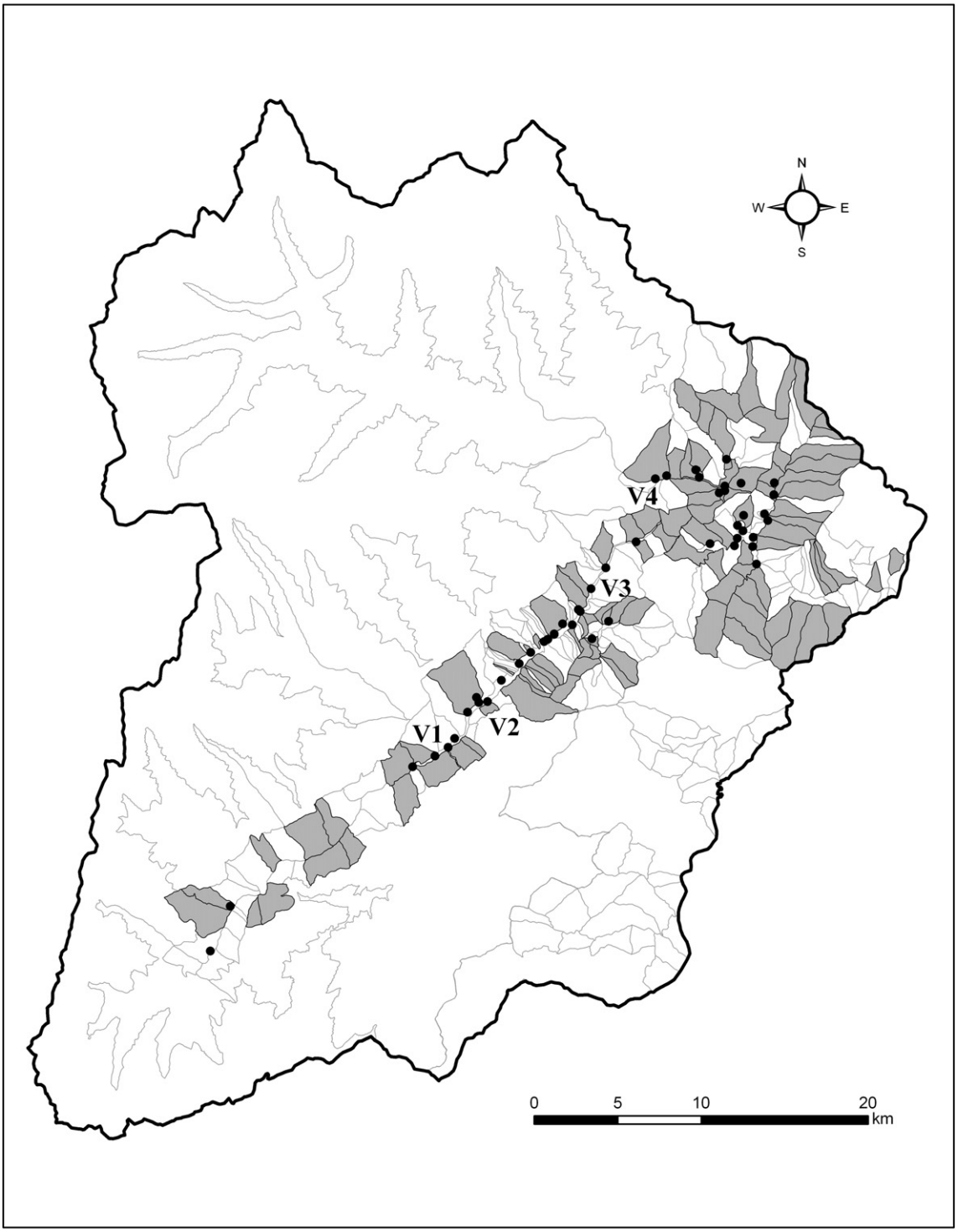

Fig. 1. The map of Wolong Nature Reserve. The gray color marks household-monitored natural forest patches. Black dots mark the distribution of residences, and experiments were undertaken in: V1 — Wolongguan, V2 — Huahongshu, V3 — Yusidong, and V4 — Gengda.

the system. Second, we undertook experiments based on the one-shot Ultimatum Game (UG) in Wolong to test how the local residents actually conform to the social norm of fairness in a general context. Based on the model and the experiment data, we made a prediction about the possible impact of the fairness norm on cooperation in the household-based NFCP and compared it with the data from a field survey. Moreover, we discussed the evolution and variation of the social norm in the changing environment, and the possible consequences for the conservation of common natural resources.

2. The Household-based NFCP Model

In the model of the household-based NFCP, each household or group of households assigned a patch of natural forest acts as a player