



Analysis

Understanding conditions for co-management: A framed field experiment amongst the Tsimane', Bolivia



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ARTICLE INFO

Article history:

Received 1 July 2016

Received in revised form 5 May 2017

Accepted 6 May 2017

Available online 25 May 2017

JEL Classification:

C93

Q3

Q57

Z13

Keywords:

Biodiversity conservation

Co-management

Common pool resource extraction game

Framed field experiment

Indigenous territory

Trust

ABSTRACT

We experimentally assess the willingness to self-enforce restricted resource use by playing a common pool resource extraction game in four Tsimane' indigenous communities in the Bolivian Amazon. We analyse the role of trust in participant's willingness to self-restrict resource use and collaborate with the authorities. Contrary to game behaviour in the industrialized world, we find that amongst the Tsimane' extractions decrease across rounds. We also find that participants who trust a) non-Tsimane' and b) the authorities extract less than other participants, but findings are not robust across rounds. Using the economic and anthropological literature, we interpret the findings arguing that trust in non-Tsimane', which is strongly correlated with market access, may capture generalized trust levels and that people with higher levels of generalized trust interact more easily in non-personal transactions, like the situation presented in the game. As co-management also entails non-personal interactions with and trust in the authorities, our findings seem relevant for community-based conservation and co-management.

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1. Introduction

Given that 85% of the world's protected areas are inhabited by indigenous peoples and that indigenous territories cover 22% of global land surface (Sobrevilla, 2008), researchers and policy makers have long attempted to bring indigenous peoples as allies to conservation. One of the most well-known attempts is the establishment of co-management, or community-based conservation, in which protected area management authorities and local communities cooperate in the management of natural resources in a specific area with the double goal to stimulate sustainable resource use and to halt deforestation and forest degradation (Armitage et al., 2009; Carlsson and Berkes, 2005; Schultz et al.,

2011). The approach is not without critiques. Several researchers have noticed that, with increasing levels of integration into the market economy, the intensity of land and resource use by indigenous populations is on the rise (Gray et al., 2008; Guèze et al., 2015). While this shift does not necessarily compromise conservation goals if indigenous communities manage their resources sustainably, it does require that indigenous peoples are willing to self-restrict their resource use in the context of nature conservation and protected area management.

This paper analyzes the willingness to self-enforce restricted resource use amongst the Tsimane', an indigenous community located in the rainforests of Bolivia. Researchers have argued that, traditionally, the capacity and willingness to self-enforce restricted resource use was achieved through social norms or informal rules (Agrawal and Gibson, 1999; Ostrom, 1990) often encoded in social taboos and traditional knowledge (Colding and Folke, 2001; Gadgil et al., 1993). Prior anthropological research in the studied communities suggests, however, that traditional norms regulating resource use

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are on decline (Reyes-García et al., 2013). Because trust and expectations of reciprocity may also facilitate cooperation, as the belief that others will self-restrict their use of scarce resources may increase the individual willingness to collaborate (Bowles and Gintis, 2002), we focus on the role of trust.

Trust and expectations of reciprocity are likely to differ between individuals and communities. For example, Alesina and La Ferrara (2002) find that within the same community, individuals who express stronger feelings against racial integration trust relatively less the more racially heterogeneous the community is. Rustagi et al. (2010) show how communities with a higher number of conditional co-operators are more successful in community forest management and Bouma et al. (2008) indicate that communities with higher trust levels are more likely to maintain collective investments in soil and water conservation. An external factor known to influence trust levels is market integration, with conflicting evidence about whether markets have a positive or negative effect (Hirschman, 1982; Siziba and Bulte, 2012). Market integration may reduce interactions at the community level, and thus decrease trust and cooperation (Bowles and Gintis, 2002); but market integration can also facilitate cooperation, as familiarization with impersonal transactions may increase generalized trust (which we define as trust which goes beyond a specific personal setting) as people become more experienced interacting with strangers (Fafchamps, 2011). For example, Henrich et al. (2005) find that the higher the degree of market integration, and the higher the payoffs to cooperation in everyday life, the more subjects cooperate in a game. Henrich et al. (2010) relate this to the way norms and institutions have evolved in modern society and Gurven (2004) to market integration leading to increased interaction with strangers. On the other hand, Kasper and Mulder (2015) find that market integration reduces cooperation as it causes traditional patterns of cooperation, based on kinship, to erode.

Furthermore, the willingness to self-enforce restricted resource use is likely to depend on people's trust in the authorities, which is determined by the institutional context in which collaboration is demanded. When resource use restrictions are externally imposed, the willingness to collaborate with the authorities in enforcing these restrictions can be expected to depend on the extent to which community members trust the authorities and perceive as legitimate both the restrictions and the authorities imposing them (Stern, 2008; Bouma and Ansink, 2013; Bouma et al., 2014). Hence, for community co-management to be successful, communities need to be willing to cooperate with each other and with the authorities, a willingness which we expect, in the communities studied, to largely depend on trust. In the context of Latin America, there are many reasons why indigenous peoples may not trust the authorities regarding land and resource management issues. In many countries, including Bolivia (Reyes Garcia et al., 2014), indigenous peoples have been granted land rights only after long and extensive struggles (Stocks, 2005). Furthermore, in many cases indigenous peoples have received rights to smaller areas of lands than originally claimed, and often with fragmented rights to land and resources. For example, when in Bolivia indigenous territories and protected areas overlap, the rules of the protected area overrule indigenous people's rights, and indigenous peoples are restricted to exploit natural resources commercially (Reyes-Garcia et al., 2014).

This paper explores i) the extent to which individual members of indigenous communities are willing to self-enforce resource use restrictions and ii) how this willingness is influenced by people's trust in each other and in the authorities. We analyse these questions using a field experiment framed in terms of wood extraction from a common forest, complemented with data from a survey in which we asked participants about their trust in several actors, including community members, non-Tsimane and the authorities in charge of the management of the territory (protected area management

authorities versus the indigenous leaders). In the next section we provide background information about the Tsimane'. In Section 3 we explain our methodological approach, including its limitations. In Section 4 we present the results and in Section 5 we discuss the main findings and conclude.

2. Background: Tsimane' Customs, Land Rights, and Resource Management

The Tsimane' are a native Amazonian society of hunter-horticulturalists, mostly settled in the lowland department of Beni, Bolivia. The area inhabited by the Tsimane' is one of the most biodiversity rich areas of Bolivia, with different forest types (Guezee et al., 2013). The Tsimane' maintained their autonomy and land occupancy relatively untouched until the 1950s. Since then, national policies aiming to promote commercial logging and to expand the agricultural frontier to the lowlands have profoundly impacted the Tsimane' way of life (Reyes Garcia et al., 2014). Amongst other effects, the increased contacts with outsiders have changed Tsimane' customs, cultural norms, taboos and rituals –which appear to have been strong social mechanisms governing traditional management practices and behaviours in the past (Chicchon, 1992; Luz, 2013). This process has happened in parallel to the disappearance of Tsimane' spiritual leaders: for much of Tsimane' known history, shamans (*cocojsi*) played an important role in the guidance of communal decisions (Huanca, 2008), mostly because of their supposed ability to communicate with forest spirits and ancestors (Daillant, 2003). With their disappearance in the 1980s, traditional forms of forest management also disappeared (Luz, 2013; Reyes-García et al., 2013). For example, Tsimane' traditionally believed that groves shelter forest spirits who could harm humans (Huanca, 2008) and such groves were typically considered sacred and protected from extraction. Consequently, sacred groves played an important role in biodiversity conservation. However, with the lack of spiritual leaders and increasing contact with outsiders, most Tsimane' have now lost fear of forest spirits and have started to extract trees from areas previously considered sacred. The example illustrates how changing cultural and socio-economic systems have affected not only local livelihoods but also the social norms governing resource use and management. Henrich et al. (2006) and Gurven (2004, 2014) suggest that, nowadays, the willingness to enforce social norms and restrictions is particularly low amongst the Tsimane', as compared to other groups.

It is important to note that changes have not been homogeneous across villages. Some Tsimane' live in remote villages, where, to some extent, traditional subsistence practices and accompanying belief and taboos are maintained, but other Tsimane' live in villages closer to roads or towns and have adopted new market-based economic activities, such as cash cropping or wage labour for loggers or cattle ranchers. These Tsimane' have largely abandoned their traditional beliefs (Reyes-Garcia et al., 2014). Besides the influence that these changes in cultural and socio-economic systems might have had on resource extraction and management, they are likely to have influenced behavioural expectations and community-level cooperation as well (Bowles, 1998). For example, in remote communities most Tsimane' continue to conduct economic transactions on the basis of personal relations (Rucas et al., 2010; Gurven and Winking, 2008), whereas in more market integrated Tsimane' villages, most people have become used to impersonal market transactions. In fact, in previous research using experimental games, Gurven (2004) and Gurven et al. (2008) found significant differences in game behaviour between Tsimane' communities and, although he could not fully explain these differences in relation to variation in market access, he reports a tendency for participants with market experience to be more cooperative than those without (Gurven et al., 2015).

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