

Voluntary cooperation and monitoring lead to success

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Many imminent problems facing the world today, such as deforestation, overfishing, or climate change, can be described as commons problems. The solution to these problems requires cooperation from hundreds and thousands of people. Such large scale cooperation, however, is plagued by the infamous cooperation dilemma.

According to the standard prediction, in which each individual follows only his own interests, large-scale [cooperation](#) is impossible because free riders enjoy common benefits without bearing the cost of their provision. Yet, extensive field evidence indicates that many communities are able to manage their commons, albeit with varying degrees of success. How do we explain this variation in management outcomes? How do different levels of cooperation emerge and what contributes to their success?

The economist Prof. Michael Kosfeld examined these questions together with his colleagues Devesh Rustagi and Prof. Stefanie Engel from the Swiss Federal Institute of Technology (ETH) Zurich. The answer: The degree of voluntary cooperation together with the monitoring of free riders plays a key role in the success of commons management.

In their field study, details of which are published in the November 12 issue of the journal *Science*, the researchers analyzed a major forest commons management program launched to save the biodiversity rich Afro-montane ecosystem and the livelihood of the Bale Oromo pastoralists in Ethiopia. The team was particularly interested in the

degree of conditional cooperation in a group. This means that group members are willing to cooperate voluntarily provided that others cooperate as well. Numerous behavioral experiments with student participants have shown that conditional cooperation plays a significant role in solving the dilemma of cooperation. However, so far no evidence exists which corroborates the relevance of conditional cooperation in the field with actual commons users. The researchers' objective was to provide exactly this evidence.

The economists conducted behavioral cooperation-experiments with 679 members from 49 different forest user groups in which they elicited the group members' willingness to cooperate voluntarily. They found that groups differ widely in their share of conditional cooperators, from 0 % to 88 %. In groups with lower share of conditional cooperators, free rider share was high. To examine how this impacts forest management success, the team ran a variety of statistical analyses which showed that groups with larger share of conditional cooperators were much more successful in managing their forests. The success of a group was determined by the number of trees of intermediate height per hectare. Trees of this kind are vital for the sustainable growth of the forest.

But why are groups with larger share of conditional cooperators more successful at forest management? To entangle this puzzle, the trio looked at the time spent by group members in monitoring their forest. They found that groups with higher share of conditional cooperators not only cooperate more but also monitor more by conducting patrols through the forest. Such patrols are important for the detection and deterrence of free riding. A group with 60 % conditional cooperators was likely to spend on average 14 hours more per month in monitoring than a group without any conditional cooperators. Devesh Rustagi, a post-doc at the Institute for Environmental Decisions, says "this finding is interesting, as it shows that conditional cooperators are willing to spend resources to detect individuals who free ride at their expense. It provides a behavioral

link in explaining monitoring as a success mechanism in commons management".

"The results of our study provide first-time evidence that conditional cooperation which has been identified in many laboratory experiments before plays a key role in a concrete case of commons management in the field," explains Michael Kosfeld, Director of the Frankfurt Laboratory of Experimental Economics at Goethe-University. "Our findings fill a long-standing gap between field and laboratory studies on human cooperation."

The results also shed light on the evolution of human cooperation. They show a positive co-variation between conditional cooperation and costly monitoring. This is in line with the theory of gene-culture evolution, which predicts higher cooperation in groups where enforcement of cooperation is prevalent.

"The results yield important policy implications for the governance of human collective action", explains Rustagi. "Because humans differ in their motivation to cooperate, an effective solution to commons problems should not be based on incentives for purely self-regarding individuals alone but needs to explicitly take into account the complex interplay of heterogeneous motivations and behavioral norms to cooperate voluntarily".

Prof. Stefanie Engel from the Institute for Environmental Decisions at ETH Zurich concludes: "Given that the UN has declared 2010 as the year of biodiversity and 2011 the year of forests, the results may in fact open new doors to find solutions to commons problems, which house nearly 18% of the world's forests and a large share of biodiversity".

Provided by Goethe University Frankfurt

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