

Game theory provides new insight on spreading environmentally conscious behavior

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The simple act of exchanging information can influence people to change their actions to protect the environment, according to a new study that links game theory with psychological science.

A new study published in the journal *Ecological Modelling* provides a unique new modelling framework, which translates findings from psychological research into a formula that can be applied to social and environmental perceptions and consumer behavior.

One of the major questions related to sustainability, environmental protection, and climate change is how to convince people to modify their behavior in ways that reduce their consumption.

"Psychological studies suggest that while making decisions about how much of a resource to harvest, consumers take both ecological and social information into perspective," says Talha Manzoor, a researcher at the Lahore University of Management Sciences in Pakistan, who started the work as a participant in the 2013 IIASA Young Scientists Summer Program (YSSP).

"In a perfect world we could have top-down solutions where governments could simply agree together on a shared solution to tackle issues like deforestation, overfishing, and [climate change](#)," says IIASA Advanced Systems Analysis Program Director Elena Rovenskaya, who

advised Manzoor during the YSSP and was a coauthor on the study. "But in the real world we can't always rely on such solutions. So the aim of this study was to see how far individual action could get us towards sustainable solutions, and how individuals influence each other."

Manzoor explains the concept through the example of fishing: in the oceans, many species are fished by multiple countries. If countries work together and agree on limits, they can ensure a sustainable stock for everyone. But in the absence of effective international agreements, individual countries will work to maximize their own profit, which could lead to collapse of the whole stock—to nobody's benefit.

The new study frames a simple model of [consumer behavior](#) and information exchange, and their impact on the dynamics of a shared renewable resource. In many cases when a tragedy of the commons occurs, the absence of coordinated decisions by individual consumers leads to overusing the resource. The researchers used the model to examine to what extent [information exchange](#) can help overcome the challenge, and whether affinity between consumers helps them to use the resource more efficiently.

They were surprised to find that, at least in the theoretical framework, consumers' individual actions could go a long way towards optimizing the use of the shared resource. In particular, when individuals attached more relevance to information about the actions of others as compared to information about the state of the resource, they were more likely to modify their actions to reduce their own consumption.

"The study suggests that one way to encourage sustainability is to nurture a general perception that the resource stock is critical due to society's overexploitation. This creates an awareness that it is society, and not nature, that is responsible for the scarcity and so the only way to save the stock is by modifying the mindsets of consumers," explains Manzoor.

Although theoretical, the study provides some reason for optimism in a world where international agreements on the environment are challenging to make and even more challenging to enforce. It implies that consumers may have more power than they think, both in changing their own behavior and influencing others.

"The beauty of this study is that it is a completely new method," says Rovenskaya. "We have taken complex [psychological research](#) and managed to translate it into a formula that can be used to examine a global problem."

More information: Talha Manzoor et al, Game-theoretic insights into the role of environmentalism and social-ecological relevance: A cognitive model of resource consumption, *Ecological Modelling* (2016). [DOI: 10.1016/j.ecolmodel.2016.09.007](https://doi.org/10.1016/j.ecolmodel.2016.09.007)

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