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Can co-management strategies improve governance in marine protected areas? Lessons from experimental economic games in the Colombian Caribbean

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Marine protected areas (MPA) are exposed to serious governance issues due to complexities associated with the impossibility to control access to and use of the common pool resources (CPR) that they are supposed to conserve. In Colombia, the National Natural Park “Corales del Rosario y San Bernardo” (NNP-CRSB), located in the Caribbean Sea, is not the exception. Although the NNP-CRSB maintains the most developed fringe of coral reef in the Continental Colombian marine platform, several sources of pressure threaten its conservation. One of the most visible sources of pressure for the resources in this MPA is the exploitation of marine resources by native communities.



Local fisherman communities -established in the national park prior its declaration-, are characterized by low standard of living and by having in the extraction of marine resources their main income-generation source.

The creation of the national park and the existence of laws and regulations controlling access and uses have not offered enough incentives to protect marine resources and to reach MPA conservation goals. In the NNP-CRSB several species are endangered and some of them seem to have disappeared locally. In response to reduction in resources, fishermen have increased fishing effort not only by fishing for longer periods or at farther distances but also, in some cases, by violating regulations when using inadequate fishing techniques, extracting under minimum allowed sizes and extracting species with full restriction, generating a conflict between communities and park authorities, and non negligible governance concerns.

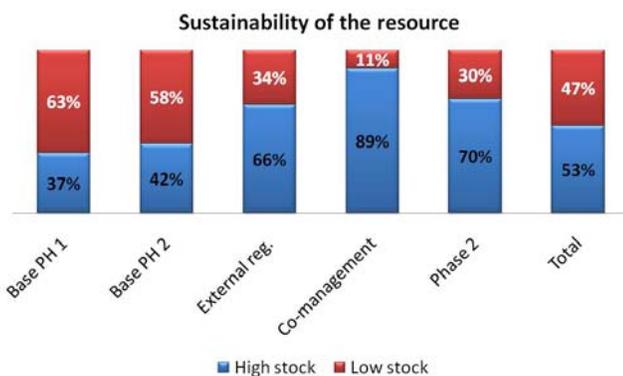
The research problems addressed with this investigation were two: i) the inappropriate exploitation of marine resources in the PNN-CRSB, and ii) the difficult relationship between the authorities in charge of the park and the population inhabiting the area.

In this context, the purpose of this research is to test the performance of a management strategy called collaborative management or co-management on fisherman extraction decisions and to compare it with other management strategies tested in literature, such as open access and external regulation.

We performed economic experimental games –EEG- with 195 fishers from eight communities located inside and around the national park, who carry out their fishing activities in the MPA. EEG are economic tools that let us analyze the CPR dilemma between private and collective interests and test statistically behavioral changes of people facing specific situations.

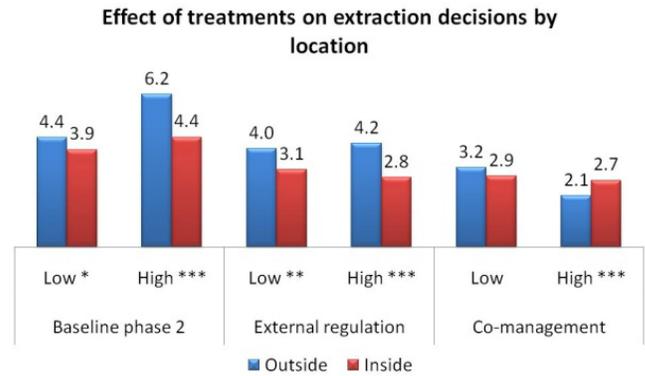


We divided the EEG into two phases of ten fishing rounds each. During first phase, no rules –or management strategies- were applied, reflecting open access: individuals were allowed to extract any amount of “fish” between 1 and 8 units. During second phase, two rules were applied: external regulation and co-management. Under external regulation, individuals were permitted to extract just one unit of the resource, being subject to a random inspection and a penalty if violating the rule. Under co-management, a ranger of the national park entered into the game and tried to convince fishers to extract just one unit of the resource, using non-coercive strategies. After the ranger speech, individuals were allowed to have repeated internal and confidential talks.



Findings show that co-management rule is the best strategy in terms of both reduction in extraction and sustainability of the resource; the later, measured as the percentage of rounds individuals kept the stock of the resource under abundance.

In addition, we found that although the two tested management strategies reduced extraction, co-management induced the lowest level of extraction in fisherman communities living outside the park. This finding becomes relevant by comparing co-management with external regulation in those communities.



Those results highlight the importance of management strategies that recognize communities as key actors in decision making for the sustainable use and conservation of CPR in protected areas.

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