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Managing Biodiversity in Common Pool Resources: Insights from Experimental Economics to Address Global Crises

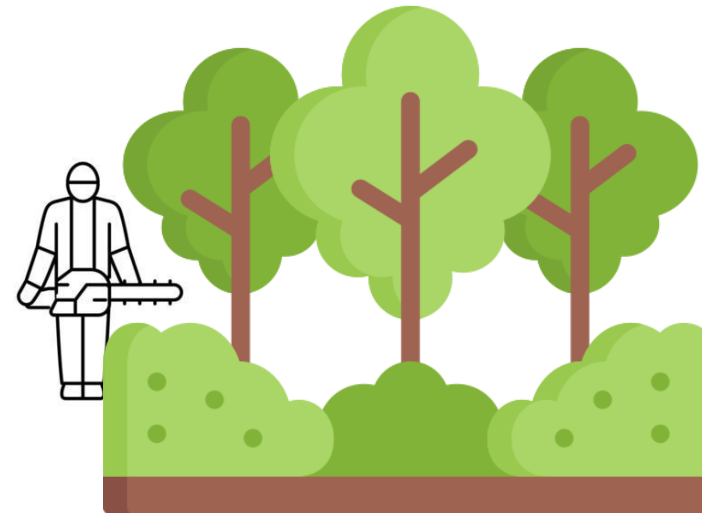
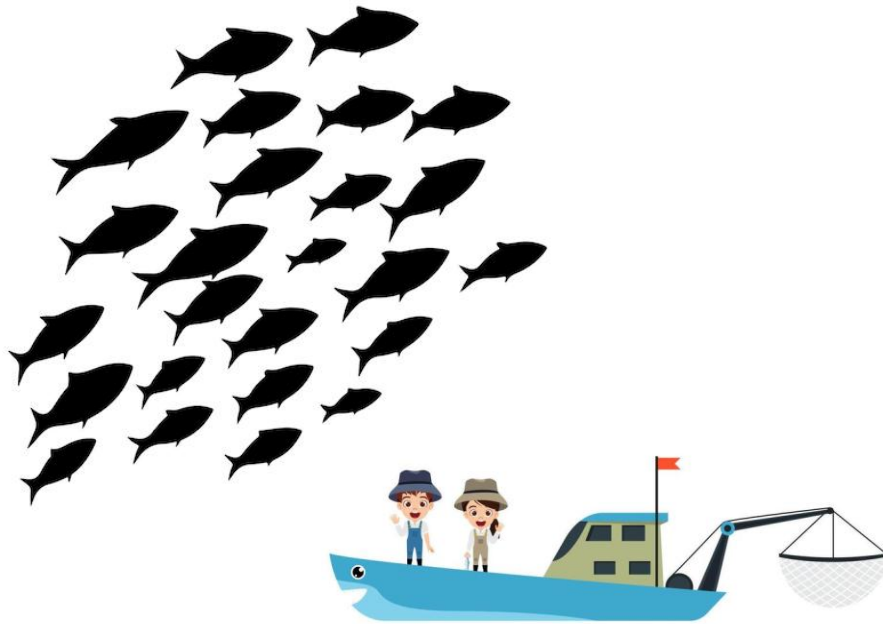
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- Billions of people in developing countries continue to rely on common-pool resources (CPR), such as forests and fisheries, for their livelihoods.
- However, the management of these resources faces significant challenges, including overexploitation, degradation, climate change, & governance failures.
- Over the years, a decentralized, community-based resource management (CBRM) approach has gained popularity.
- CBRM simultaneously engages communities and resource users in decision-making processes and integrates local organizations, practices, management knowledge, and enforcement mechanisms (e.g., Calfucura, 2018).
- While CBRM initiatives improve local public good provision, evidence on their effect on improving local decision making is limited due to insufficient data on ***social capital*** (*ability to cooperate and trust one another within communities*).

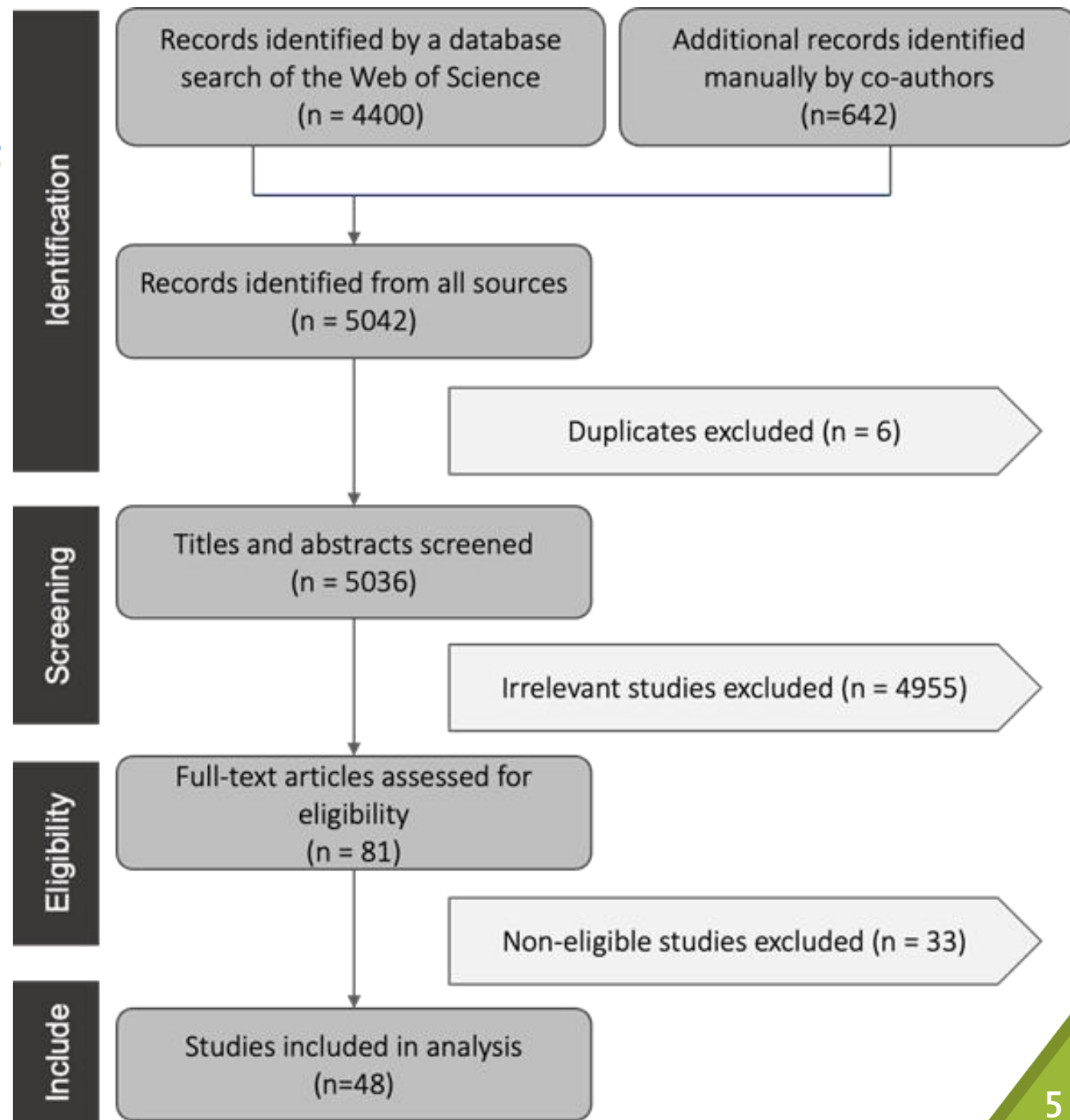
- Studies revealed that ***social capital*** is a key factor in the success of community resource management, even in developing societies that lack formal institutions (Ostrom 1990).
- However, earlier non-experimental studies, including those using surveys to measure social capital suffer from measurement and identification problems.
- Experimental methods have emerged as a powerful tool to study the underlying mechanisms of cooperation in the field (Charness et al., 2013) enabling us to measure the level of social capital (e.g., Dasgupta et al., 2025).
- However, there is no study that reviews past experimental studies and synthesize their uniqueness, and how these experimental studies complement non-experimental studies.

- To synthesize trends and insights for sustainable management by conducting a systematic review of 48 field experimental studies on community-based management of **fishery** and **forest** CPRs.



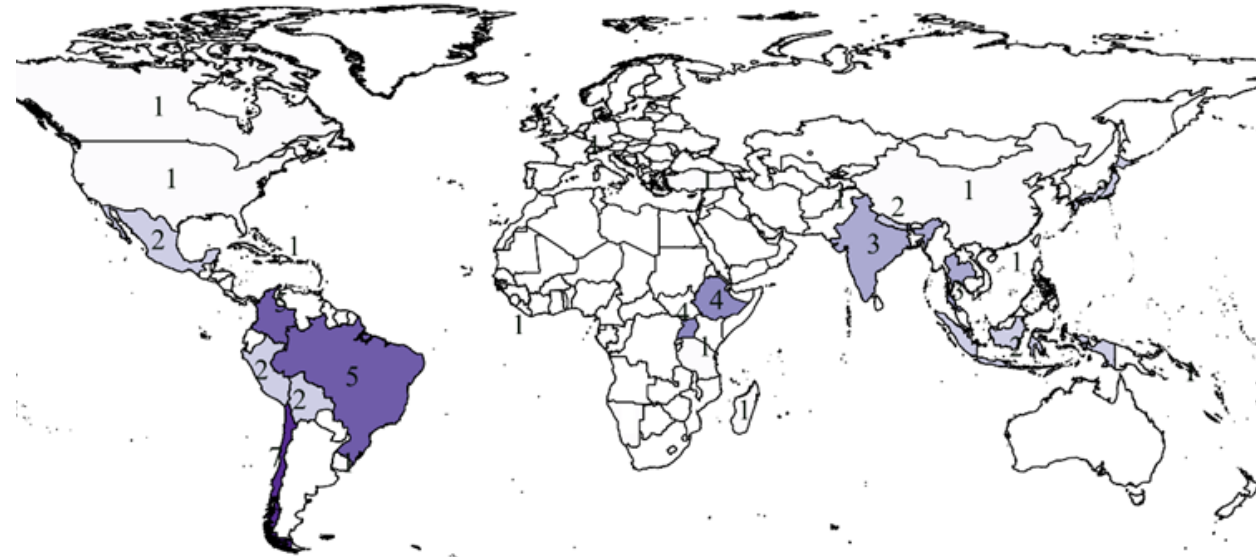
Methods

- We used the “Preferred Reporting Items for Systematic Reviews and Meta-analysis” (PRISMA) guidelines (Moher et al., 2015).
- We searched the Web of Science Core Collection database for peer-reviewed, full-text publications written in English and published up to November 2024.
- We used many terms related to community-based management, a field experiment, and a forest or fishery resource

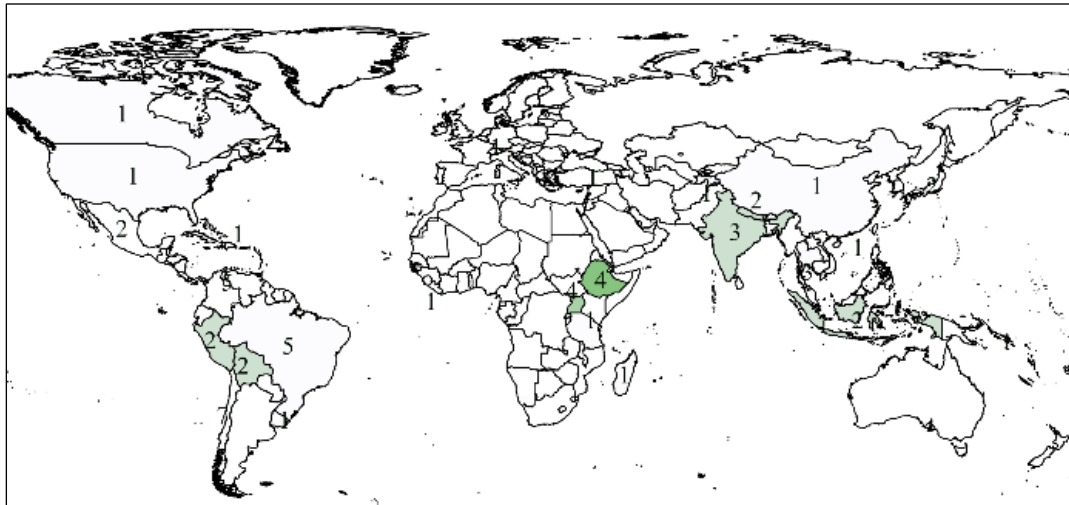


Results: Study Characteristics

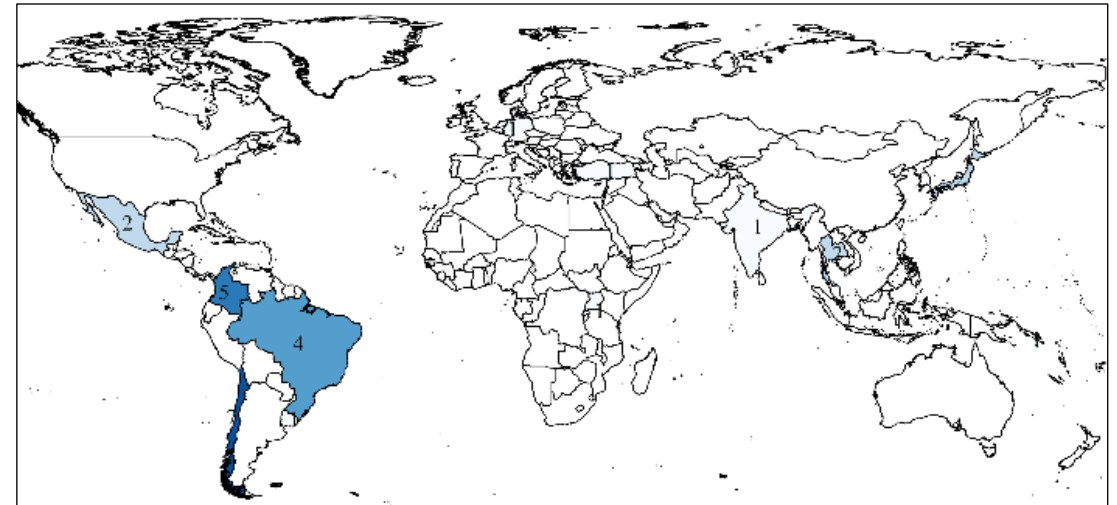
Studies
classified
by countries



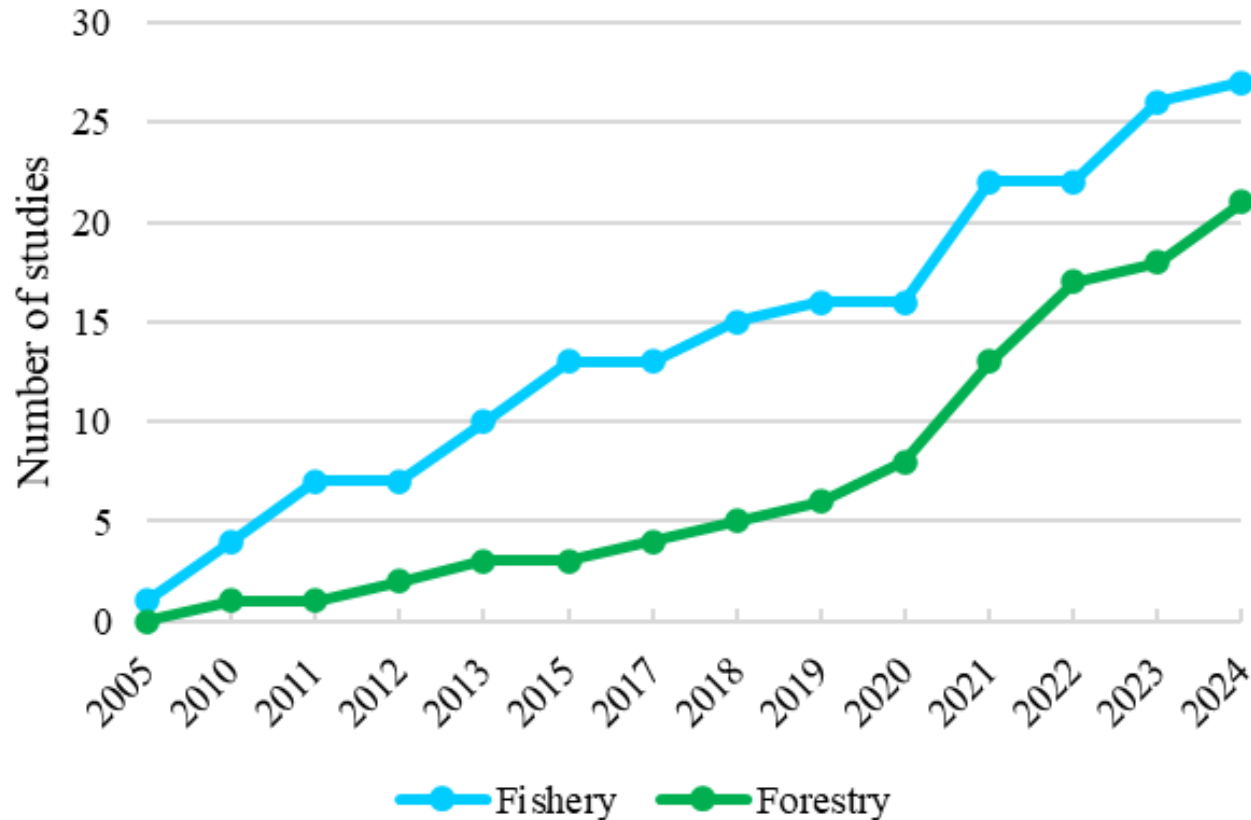
Number of forest studies by countries



Number of fishery studies by countries



Results: Study Characteristics

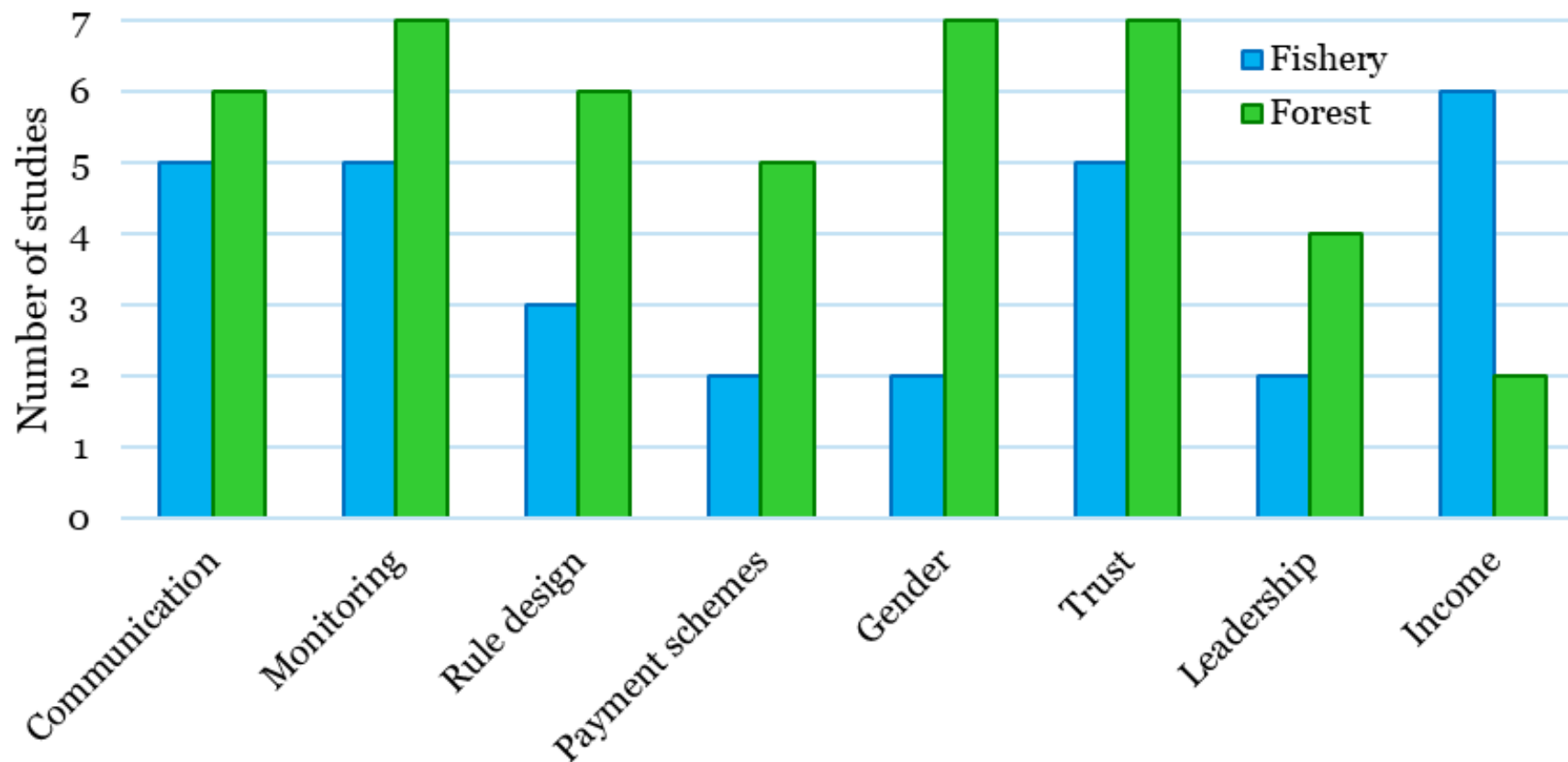


- The number of studies in forestry has largely increased between 2018-2024.
- The field experiments in fisheries have been consistently conducted throughout the same period.
- A majority of studies in both fishery and forestry are conducted in sites exhibiting **moderate to high resource dependency** (16 out of 27 fishery studies; 15 out of 21 forest studies).

Cumulative number of field
experimental studies by CRP type

Results: Empirical Findings

- Communication, monitoring, rule design, payment schemes, gender, trust, leadership, and income statistically influence the willingness to participate in resource conservation.



Frequency of key factors in CPR experiments identified as significant in fishery vs. forest CPR field experiments.

Policy Recommendations from Studies

- Create forums or policies that encourage resource users to communicate, share information, and discuss management decisions.
- Support community-based monitoring systems by empowering local residents, rather than relying solely on external enforcement.
- Allow user groups to collaborate with government to set and adjust rules.
- Fairness and equity in rule-making are important to promote cooperation.
- Pair incentives with robust monitoring and investing in social capital so that communities remain aware even when payments end.
- Empower marginalized groups (especially women) and local leaders (e.g., training in facilitation and conflict resolution).
- Provide participatory training programs with topics of direct relevance to stakeholders' immediate concerns and integrating risk-based scenarios to enhance the knowledge and awareness of resource users.

- Replicate experimental studies across diverse ecological, cultural, and institutional settings to strengthen the external validity of findings.
- Explore how behavioral responses differ by gender, education, birthplace, socio-economic status, or prosocial orientation.
- Conduct longitudinal research designs to examine whether the impacts of interventions (e.g., monitoring or incentives) are sustained over time.
- Explore how perceptions of risk, ambiguity, and social externalities shape decision-making.
- Prioritize field experiments in forest-rich and countries to identify and test sustainable strategies for conserving critical natural resources.

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