

EE475: Natural Resources Economics

Fisheries resources: Community-based and Co- management Approaches

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Outline

- Video: *Crab Bank in Cambodia* (<https://www.youtube.com/watch?v=ogbWE61HpyS>)
- Video: *Yadfon sauve les pêcheurs thaïlandais ! - Cause à Effets (Yadfon Foundation Trang, Thailand)*(<https://www.youtube.com/watch?v=1RjFdteQMXY>)
- Video: *Lake Tanganyika: Protecting the future through co-management* (https://www.youtube.com/watch?v=P-P4As_gqSo)
- Reflection
- Video: Co-management, sustainable fisheries (<https://www.youtube.com/watch?v=N37OSIFQ37M>)
- Summarizing the article: Gutierrez, Hilborn, and Defeo (2011). Leadership, social capital and incentives promote successful fisheries

The article

Gutiérrez, N. L., Hilborn, R., & Defeo, O. (2011). Leadership, social capital and incentives promote successful fisheries. *Nature*, 470(7334), 386–389. doi:10.1038/nature09689



Motivation and Objectives

- No comprehensive evaluations to support the hypothesis that co-management improves fisheries' governance systems and performance indicators.
- Objectives
 - Test whether co-management improves fisheries' social, economic, and ecological success
 - Identify and evaluate the relative merits of different co-management attributes across fisheries

Research Methods

- Assembled worldwide data from the peer-reviewed literature, government and non-governmental organization (NGO) reports and from interviews of experts on co-managed fisheries.
- Identified 130 co-managed fisheries in 44 countries covering artisanal and industrial sectors, a variety of ecosystem types, degrees of human development, and social, economic and political settings
- Extracted 19 variables relating co-management attributes under five categories suggested by Ostrom for analyzing social-ecological systems.
- The variables were used to predict eight binary measures of success.
- Using statistical methods (e.g. regression tree model, random forest model)

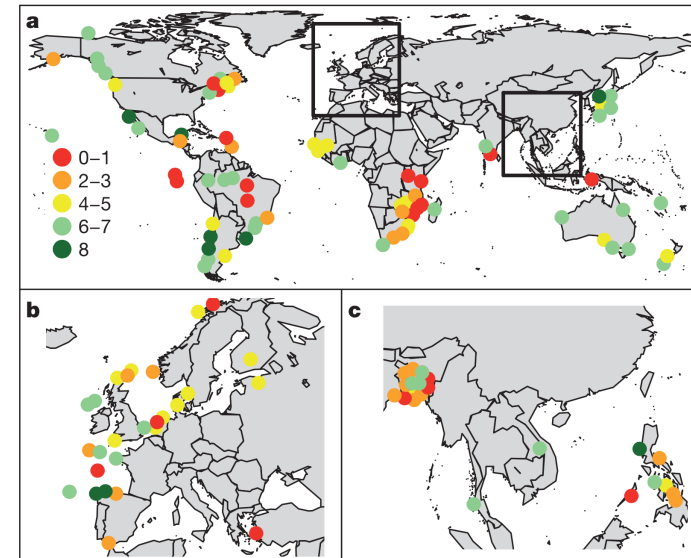


Figure 1 | Location and success score for all study cases of fisheries co-management. a–c, Success was grouped in five categories according to number of social, ecological and economic outcomes achieved. a, Global map. Insets are Europe (b) and Southeast Asia (c). $n = 130$.

Table 1 | Fisheries co-management attributes and outcomes.

Group	Variable name	Frequency (%)
Co-management	Type (consultative, cooperative, delegated)	-
	Phase (pre-, implementation, post-)	-
	Time frame	-
Resource system	HDI (low, medium, high, very high)	-
	Governance Index	-
	Corruption Perceptions Index	-
	Resource type (single*, multi-species)	-
	Ecosystem (inland, coastal, offshore)	-
Resource unit	Fishing sector (artisanal, industrial, sequential)	-
	Defined geographic boundaries	52
	Sedentary/low mobility resources	38
Governance system	Central government support (local)	93
	Scientific advice	92
	Minimum size restrictions	76
	Long-term management policy	71
	Global catch quotas	52
	Monitoring, control and surveillance	47
	Protected areas	39
	Spatially explicit management	37
	Individual or community quotas	33
	Co-management in law (national)	32
	Seeding or restocking programs	19
	TURF	18
Users system	Social cohesion	78
	Self-enforcement mechanisms	71
	Leadership	62
	Tradition in self-organization	55
	Influence in local market	28
Outcomes	Community empowerment	85
	Fishery status (under or fully, over-exploited)	67
	Sustainable catches	62
	Increase in social welfare	61
	Increase in catch per unit of effort	54
	Add-on conservation benefits	45
	Increase in abundance	38
	Increase in unit prices	30

All attributes were grouped according to the classification of Ostrom¹⁶. Values in the frequency column denote percentage of co-management attributes reported as present within the co-management systems. For complete variable descriptions see Supplementary Table 2.

* Benthic, demersal, pelagic, mammal.

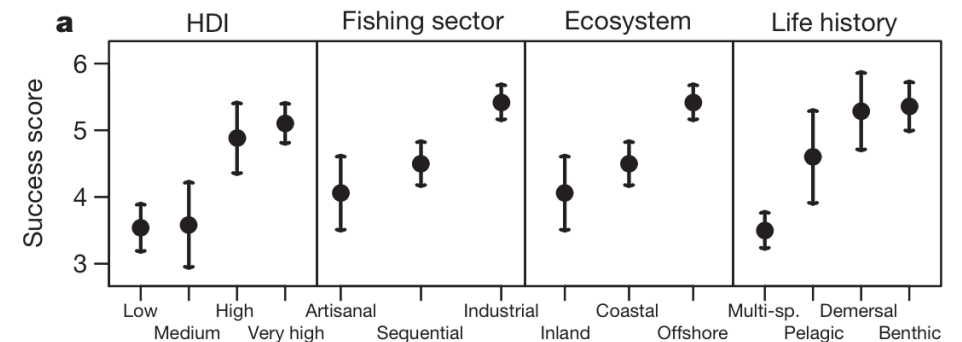
The outcome indicators

- **Fishery status:** under-exploited, fully-exploited and over-exploited fisheries
- **Increase in abundance:** Increase in stock abundance as a result of co-management practices
- **Increase in Catch Per Unit Effort** as a result of co-management practices.
- **Increase in Unit Prices** as a result of co-management practices including improvement in final product quality, marketing strategies, and excluding market externalities

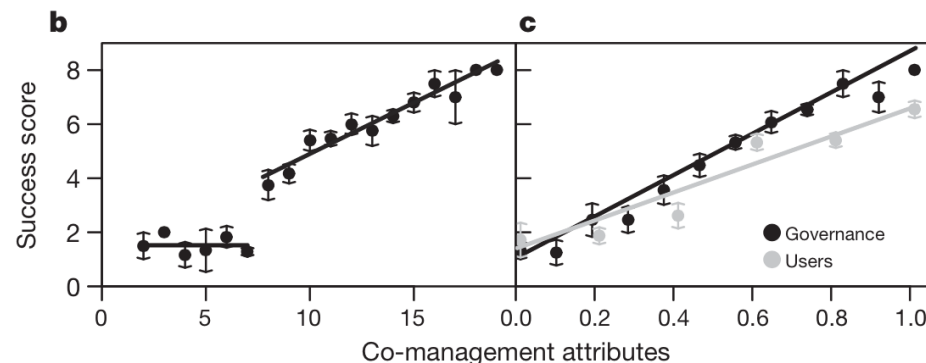
The outcome indicators

- Evidence of **Sustainable catches** regarding stock productivity in long-term
- **Community empowerment**: increase in spiritual, political, social, and/or economic strength of communities
- **Increase in social welfare**, including incomes and social equity
- **Add-on Conservation Benefits**: Direct and indirect species and habitat conservation benefits through co-management practices.

Some findings



Some findings



The most important co-management conditions necessary for successful management of fisheries

- Presence of Leaders
- Strong social cohesion
- Individual or community quotas
- Community-based protected areas

The most important co-management conditions necessary for successful management of fisheries

- Enforcement Mechanisms
- Long-term management policies
- Influence of fishers in local market