

Efficient and sustainable management of shared fisheries: Self-governance or regulation?

Problem Statement

In Thailand, artisanal fishers account for about 80 percent of all fishing vessels. According to the Department of Fisheries (2015), the fisheries resources that these fishers depend upon are severely degraded. Department of Fisheries introduced the quota system in terms of total allowance efforts (TAE) for the commercial fishery in 2017, however, a proper regulatory solution for artisanal fishery can be hard to find when they depend on their catches in terms of both social and ecological context. Nevertheless, the quota system has been put forward as one potential solution.

Objectives of this study

In this study, we aim to increase our understanding of behavioral strategies adopted by artisanal fishermen under different types of quota regulations. More specifically, we want to

- 1) test how fishermen who are regulated by a quota (total allowance catches: TAC) with punishment performs in comparison with a self-regulated fishery without punishment, and
- 2) test how fishermen who are regulated by a quota with a high probability of punishment performs in comparison to a regulated quota with a low probability of punishment. We evaluated performance in terms of efficiency and sustainable resource use.

Treatment and Method

We used a controlled behavioral CPR (common-pool resource) experiment as a method for this study.

We tested the three treatments, namely,

- 1) Self-governance without punishment
- 2) Regulated quota with a low probability of punishment
- 3) Regulated quota with a high probability of punishment

1

Self-governance without punishment

10 – 14 rounds

184 participants or 46 groups

2

Regulated quota with a low probability of punishment

10 – 14 rounds

176 participants or 44 groups

3

Regulated quota with a high probability of punishment

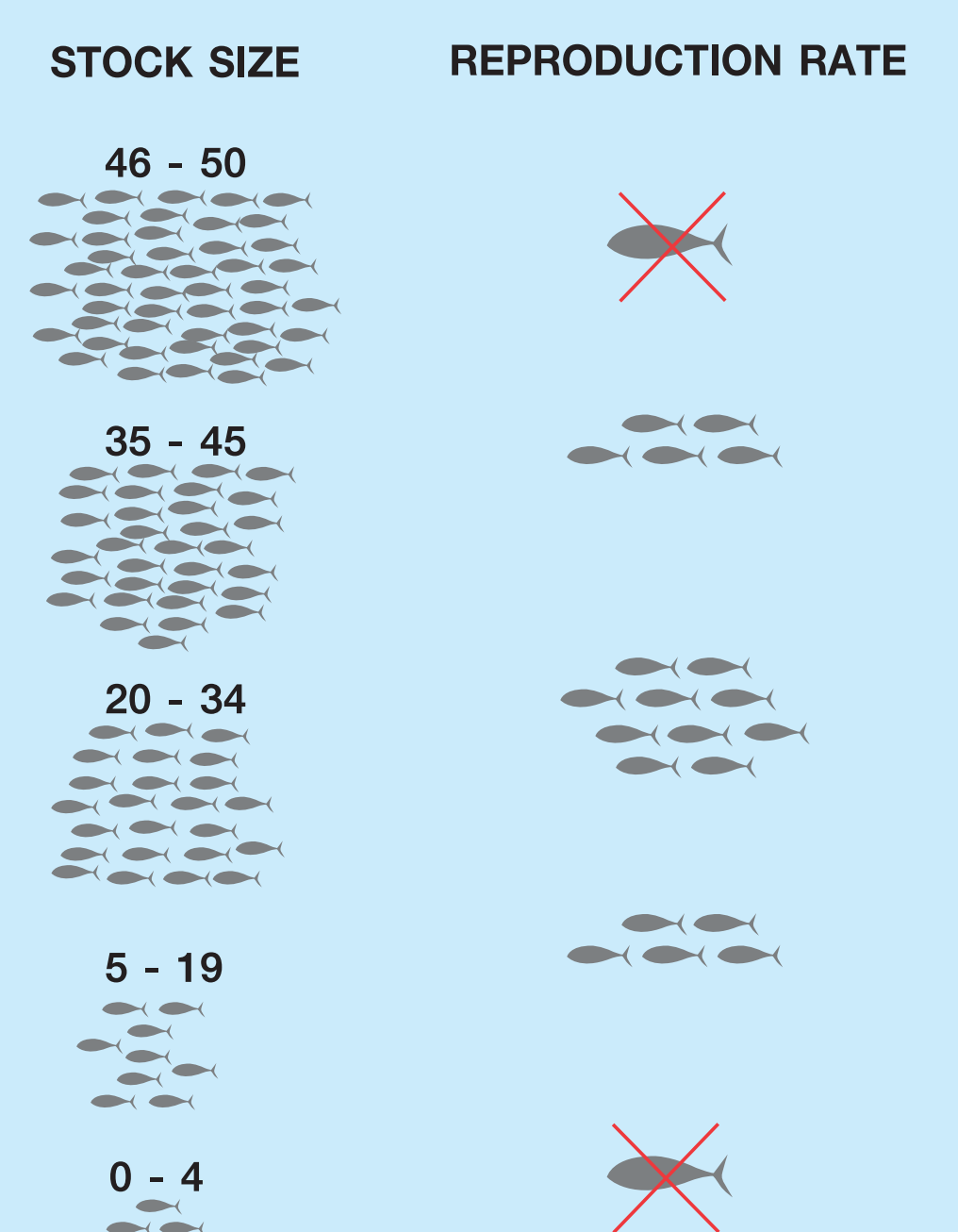
10 – 14 rounds

180 participants or 45 groups



Our participants are 540 artisanal fishers from Nakhon Si Thammarat province, which reported the second-highest number of artisan fishers in Thailand in 2015.

In the CPR experiment, each individual chooses an extraction level (i.e., how much to fish from a shared fishing ground). Each action an individual takes in the experiment affects the shared resource (fish stock), which in turn affects all the individuals' returns (i.e., all their livelihoods).



Over a number of rounds (unknown to the participants), each participant makes a private and anonymous decision about how much to extract.



Results and Policy recommendation

- 1) A regulated quota provides higher overall efficiency and more sustainable resource management compared to self-governance. "This could be because the community empowerment in these communities is not strong enough to make fishers cooperate effectively. This reason is consistent with information from the focus group discussion that most fishers disagreed with the community quota allocation because they thought it was impossible that fishers could come to an agreement on a self-regulated quota allocation"
 - 2) The higher probability of punishment in the quota treatment promotes more equal shares of payoffs from the experiment.
 - 3) The more monitoring in the quota system, the less likely it is that the fish stock will be depleted. It is implied that the quota system without an effective monitoring system may not guarantee that the fish stock will not be jeopardized in the future.
- Furthermore, educating fishers to understand how the fish stock regenerates and how that depends on the current stock of fish will help to avoid resource depletion. It should be noted that the findings of this study should be carefully interpreted. These findings may not be applicable to all fishers in Thailand, which may live in different contexts, but need more replication to confirm these conclusions. Also, there may be other ways to regulate these fishers that may be even more effective, however, we focused only on a quota system in this study.

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