Alanya Coastal Fishery

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Part I: Static Analysis - Collective action

The coastal fishery in Alanya is situated in Antalya Province along the southern Mediterranean coast of Turkey. The original case, which spans from 1976-1978, catalogues approximately 100 registered fishermen operating 45 small inboard boats; pelagic fish (including bonitos and large carangids) are the target resource unit. There is only one broad user group organization and 4 subgroups: a) Cooperative member fishermen, b) Non-cooperative fishermen, c) Sports fishermen and d) Spearfishing divers and former fishermen now working in tourism. The fishermen in the cooperative cooperate with one another and have access rules that involve listing the fishing spots and then distributing the spots for fishing in turn for a specific period through a lottery. The fishermen use the mechanisms of the local cooperative to oversee the lottery even though only half of the fishermen belong to the cooperative. The success of the fishermen's cooperative is adapted by other subgroups to eliminate inter-industry competition for mutual success. The key resources (natural infrastructure) in the system are the complex marine food web (shared). The key resource relevant to the commons dilemma faced by the community is the pelagic marine fish stocks and their productivity (common-pool). This case study is part of the original Common-Pool Resource (CPR) database. A summary of the original CPR coding conducted in the 1980s by Edella Schlager and Shui Yan Tang at Indiana University may be found here.

1.1 The Commons Dilemma

- Since 1960, the increasing number of net fishermen in the area led to severe conflicts as fishermen were cutting off one another's supply of fish by placing their nets too close and crowding the better sites. Over a period of 15 years, the net fishermen of Alanya overcame the conflict in designated fishing boundaries as they developed a fishing system to minimize gear interference and optimize production of the best sites by allocating them through a lottery system with a rotation provision to ensure equal chances of fishing the best sites. Fishermen have perceived this 'semi-formalized' system effective during the migratory fishing season between September - January as fair since some of them have applied it to fishing other species during the off-season as well as for tourism sites.

- In terms of the potential under-provisioning of public infrastructure, the success of local-level management is outside the control of the local fishermen. Fishing rights cannot be formalized by the cooperative as it has neither the legal authority nor the financial strength to bring all of the fishermen under the jurisdiction and management of the cooperative.

1.2 Biophysical Context (IAD)

- **Natural infrastructure:** The Mediterranean Sea consists of biologically-poor waters due to its oligotrophic (i.e. low nutrient levels) conditions leading to low levels of productivity. However, the continental shelf of the Alanya coastline drops off rapidly leaving target migratory fish species in highly concentrated numbers at their preferred depth levels. Due to fish concentration along migratory paths, fishermen, who were members of the cooperative, agreed to a semi-formalized rotational and lottery-based site allocation system for equitable access to these highly productive fishing sites. From September to December, fishermen harvest carangid species (mainly Lichia spp.) as they

migrate from east to west and when they reverse migration from west to east after January. During most of the June to August period, fishable stocks are scattered throughout the bay. The small size of the community allows effective community monitoring, aligning ecological visibility with social enforcement and supporting long-term compliance and check entry of the non-member fishermen..

- **Hard human-made infrastructure:** The fishermen of Alanya operate 45 small inboard boats which appears to be a combination of mixed and partly unspecified form of ownership. About 25 or more boats, each with two fishermen, participated in the cooperative's lottery-based rotational system. Some boats are likely family-owned and jointly operated by cooperative members, while others may include non-member crew, implying that the cooperative's management extended over more boats than formally recorded in the original CPR case.

- Few boats are equipped with depth recorders or fish finders. The gears used are mostly trammel nets, which are modified gillnets of small or large mesh depending on the target species and set on the bottom within the shelf area, and longlines, which consist of a series of baited hooks on a main line attached to a float. Boats return to home ports within a day and the catch is marketed locally. The semi-formalized rotational and lottery based allocation of site rights ensures that all fishermen get an equal chance to fish in the best sites.

1.3Attributes of the Community (IAD)

- **Social Infrastructure:** Membership to the cooperative helps legitimize the fishing system, which is negotiated at a coffee house where a randomized and rotational allocation of fishing rights takes place every September at the beginning of the migratory species fishing season. During this meeting, a master fisherman compiles a list of those who want to participate in the net fishery, and a list of the named fishing sites, which are regularly spaced to minimize gear interference (however, it is not clear how the system elects or selects the master fisherman and to what degree his authority works). Fishermen draw lots to randomize allocation and to ensure that every interested fisherman is assigned to a fishing site. These informal rules are semi-formalized in a contract that outlines the named fishing locations and agreed-upon fishing arrangement which is then deposited with the local gendarme and the mayor. From September to January, each fisherman moves to the next site east each day. Fishermen in excess of the number of sites in rotation draw blanks, and they are rotated in, while those holding the blanks can rest, mend nets, or go longlining. When the fish reverse their migration in January from west to east, fishermen also reverse their movements by shifting one site to the west each day until the end of the season. Trust among resource users appears high, since this system is voluntarily adopted for other fisheries (inferred).

- **Human Infrastructure:** Human infrastructure in the Alanya fishery is assumed to be high (inferred), even though the percentage of traditional fishermen is under 50.

1.4 Rules in Use (IAD)

1. Position Rules:

- Approximately a) 50 fishermen who are members of the cooperative, b) 50 fishermen who are non-members of the cooperative, c) One master fishermen who is responsible for compiling a list of fishermen participating in migratory fishery and a list of the named fishing spots, d) The local Mayor e) The local Gendarme

2. Boundary Rules:

- The right to fish is not restricted in a general sense, but access to the highly productive net fishing sites is restricted to the members of 'the community of fishermen'.
- Members of 'the community of fishermen' are informally defined on the basis of their willingness to consent to an agreement that outlines the randomized and rotational parameters of the fishing ground with respect to the best fishing sites.
- The 'community of fishermen' semi-formalizes rules for entry into the net fishery at the beginning of the migratory fishing season beginning in September. Fishermen who endorse a list of preferred fishing locations, may enter the fishery on agreed-upon fishing arrangements to a particular fishing site assigned through a lottery.
- Knowledge of the names and locations of the preferred fishing sites selected by the 'community of fishermen' agreement is key to restricting access to only those fishermen who have served an apprenticeship in the fishery, either as hired crew or as family members or friends.
- Fishermen in excess of the number of available fishing sites in rotation draw blanks and cannot fish until the next rotation.
- Self imposed institutional control restricted the over capacity of fishing by reducing the number of small fishing boats from 45 between 1976-78 to 37 in 1983 and 40 in 1985

3. Choice Rules:

- Non-cooperative members may sell their catch to independent vendors in the town market.
- The informal contract for entering the net fishery, though not legally binding, may be enforced by the mayor and gendarme, although not likely.
- 'The community of fishermen' may draft and enforce local fishing regulations for the net fishery according to a loose interpretation of the Aquatic Resources Act, which states that cooperatives have jurisdiction over \local arrangements".
- Fishermen who want to participate in the rotational system must have knowledge of the fishing ground in order to be familiar with the named fishing sites and be able to follow the fishing order and set nets in the right place.
- Cooperative members may fish with longlines for demersal species or handlines for pelagic species, though not under any formalized agreement.
- During June-August off-season of migratory species, when the semi-formal randomized rotational agreement is not in effect, net fishermen continue to follow an informal norm of mutual respect, maintaining approximately a one-mile distance between their nets to avoid gear interference and sustain cooperative relations.

4. Aggregation Rules:

- At the yearly September meeting of `the community of fishermen', those interested in entering the net fishery decide whether or not to agree to the list of available named fishing sites and the rotational order for fishing them. Once they agree, and endorse the contract, they can enter the assigned fishery.

5. Scope rules:

- Noncompliance of the rotational agreement leads to the application of social sanctions and sometimes with threats of violence.

6. Information Rules

- Before the start of the migratory fishing season in September, a lottery is drawn from among the list of preferred sites to avoid conflict over site allocation and fish without gear interference among the members.

7. Payoff Rules:

- Every member fisherman participating in the rotational system, gains fishing rights only at the assigned site during his turn.
- Members who violate the rotation order or fishes outside the assigned site face community-imposed social sanctions or exclusion from future lotteries. [1]

1.5 ADICO Grammar

Every participating fisherman (A) must (D) fish only at the lottery assigned site (I) during the migratory season (C), or else face sanctions (O).

1.6 Vulnerability Assessment

Alanya Fishery System risks institutional vulnerability as the rotational and lottery-based system is semi-formalized as it is not legally binding. The cooperative probably does not have the economic capacity to govern the entire community of all 100 fishermen. The system is also biophysically vulnerable as it is built on biologically poor waters with low nutrient levels. A slight shift in water temperature or nutrient level is most likely to impact the abundance and availability of migratory fish stock, leading the system to a sudden collapse.

1.7 Summary

It is assumed that there is limited or no conflict between the small boat fishery and other kinds of fisheries in Alanya, as well as competition with an increasing number of sport fishermen and spearfishing divers in the area. The case provides an elegant example of rules of fishing conduct (i.e. the rules governing how the accepted users shall conduct themselves). Despite the lack of formal control of the cooperative over fishing rights, fishermen in this area can and do influence the fishery via an organized and randomized rotational system of fishing site allocation among the members of the cooperative who agree to the arrangement every year. Furthermore, the author argues that because the resource users meet annually to compile the list of participating fishermen and available fishing spots, the system is flexible to changing conditions, e.g., in 1983 there were 34 sites and 37 boats, and in 1985 there were 37 sites and 40 boats.

2 Part II. Dynamic Analysis - Robustness

Given the source document, there is insufficient data to make any assessment on the temporal dynamics (resource and social conditions, etc.) of this particular common-pool resource. The contributors thus far have been unable to locate any specific updates for this case study. Based on the 2024 data from the Turkish Statistical Institute (TÜİK), Alanya's population was 361,873 in 2024. The tourism season begins in late May or early June. Alanya (now) offers the tourists a Fishing Tour in the deeper Mediterranean sea area (tourists can also fish at the beach but the fish are small). The Tour will carry the tourists to areas such as the red tower, old shipyard, the sea caves, and Cleopatra beach. Tourists who are amateurs in fishing will be trained by a professional captain of the essential details of fishing. And the boat will provide all fishing equipment. Tourists can also eat the fish they catch.

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[1] The expulsion might have caused the reduction of small fishing boats