

# Institutional Analysis of Messolonghi-Etolico Lagoon Fishery, Patraikos Gulf, Greece

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## 1 Part I: Static Analysis - Collective action

The Messolonghi-Etolico lagoon is in the northern part of Patraikos Gulf, on the west coast of central Greece. The original case, which was published in 1984, catalogues an action situation with approximately 200 independent fishermen and 170 fishermen in 11 co-ops. The key resources (natural infrastructure) in the system are the marine food web. The key shared resource relevant to the commons dilemma faced by the community are marine fish stocks (mulletts, sea-bream, eel, and sea-bass) and their productivity (common-pool). The co-ops feel the independents are free-riders on co-op efforts to trap fish; independents resent the co-ops' privileges, power, and subterfuges to restrict membership which would allow independents the use of different gear. The result is inefficient use of the lagoon's fish, violent confrontations, gear violations, and ecological stress.

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

- Potential over appropriation / poor coordination of appropriation: The commons dilemma arises as the two groups of fishermen: cooperatives and independent fishermen, target the same fish stock, and they both fish close to the lagoon mouth. Both groups also violate appropriation rules. The cooperatives set fish traps of very fine mesh to ensure maximum yield, and often, do not remove the fences and traps completely from the lagoon mouth during spring, in order to reduce expenses. Accordingly, the cooperatives catch includes significant quantities of fry and fingerlings, which die in the traps during summer time,. The independent fishermen fish legally or illegally during spring-time at the lagoon mouth. There is no indication that any monitoring is conducted by user groups or others. Cooperative members believe that the independent fishermen are free-riding without making any investments and, thereby, unfairly reducing the income of cooperative fishermen. Independent fishermen believe that the cooperatives are closed clubs that willfully preclude them from membership. Conflict between the two user groups appears entrenched.
- Potential under provision of public infrastructure: There is no mention of any hard public infrastructure which is common in fishery cases. In regard to soft public infrastructure, this is provided by the governor, who stipulates fishing rights and permissible

gear, and the Ministry of Agriculture who is in charge of supervising. It is not stated, but it seems that the Ministry has not an active role at monitoring since they do not know fishing amounts, and since cooperative and independent fisherman are disrespecting appropriation rules. Normally appropriation dilemmas lead to the under provisioning of public infrastructure, and in this case there is no evidence of an effective collective action to change rules to reduce conflicts and protect the biomass from being overexploited.

## 1.2 Biophysical Context (IAD)

- **Natural infrastructure:** The Messolonghi-Etolico lagoon is in the northern part of Patraikos Gulf on the west coast of Greece. It lies between the estuaries of the Evinos and Acheloos Rivers covering a total area of 16,500 ha. The Etolico lagoon is the smaller of the two, with an area of 1,750 ha and a maximum depth of 30 m, while larger the Messolonghi lagoon has an area of 14,750 ha and a maximum depth of 45 m. Klissova lagoon, with an area of 2,650 ha, is an important section of the Messolonghi lagoon. Anthropocentric modifications to the lagoon conducted in the 1950s in order to benefit agriculture and salt production reduced the fishing grounds of the lagoon to an area of 10,500 ha. The lagoon has an average rainfall of 737 mm/year, average air temperature of 18-19°C, and the average lagoon water temperature is 12-28°C. An area 12.5 km long and 350 m wide across the lagoon mouth is leased to the cooperatives, and there is an unleased area that is being exploited by the independent fishermen. Fishery yields have been declining which is attributed to the detrimental fishing practices of both groups. Tidal current speed is reduced and the rate of water renewal in the lagoon is slowed due to cooperative fishermen illegally placing and leaving fences too close to the lagoon mouth, as well as using fish traps with very fine mesh.
- **Human-made infrastructure:** Fences, traps, mesh, spears, long-lines, and boats (motorized and non-motorized) are the primary private human-made hard infrastructure that are used for fishing. There is no mention of public hard human-made infrastructure in the text.

## 1.3 Attributes of the Community (IAD)

- **Social Infrastructure:** The lagoon itself is owned by the Greek state. The Ministry of Agriculture, which is the supervising authority of the lagoon, stipulates that fishing of any kind is not allowed within a zone of 500-1,000 metres from the mouth of the lagoon towards the Patraikos Gulf. This zone is wider for trawlers. The governor of the state has the authority to lease out parts or all of the lagoon to cooperatives or business men.

In 1960, a single, large cooperative was formed by the government to include all 600 fishermen in the region. The cooperative faltered in 1966 because local fishermen were not used to the idea of collective work (Kotsonias 1984:526). Immediately following the dissolution of the large cooperative, many small cooperatives ranging in size from 8 to 60 members were formed, of which at the time of the study report 11 cooperatives remain with about 170 members in total. Since 1981, the area across the lagoon

mouth has been leased out to these 11 fishermen cooperatives for a period of 10 years. An unleased area of the lagoon is used by independent fishermen, who are residents of Messolonghi, Etolico, and Neochori. Cooperative members believe that the independent fishermen are freeriding without making any investments and, thereby, unfairly reducing the income of cooperative fishermen. Independent fishermen believe that the cooperatives are closed clubs that willfully preclude them from membership. Conflict between the two user groups appears entrenched.

- **Human Infrastructure:** Human infrastructure in the Messolonghi-Etolico lagoon is generally assumed to be high among the independent fishermen because they have a long tradition of spear-fishing in the area and are well-known for their skill. The human infrastructure for cooperative fishermen is probably adequate (inferred), but the governance structures and rules regarding resource extraction appear to facilitate overexploitation.

## 1.4 Rules in Use (IAD)

### 1. Position Rules:

- Ministry of Agriculture has supervisory authority over the lagoon.
- Governor of the province has authority to lease out parts or all of the lagoon to cooperatives or businessmen.
- 170 fishermen, each registered as a member in one of the 11 cooperatives
- 200 independent fishermen, about half of which want to belong to a cooperative and the other half does not.

### 2. Boundary Rules:

- Fishing grounds on the lagoon are leased out to cooperatives for a period of 10 years.
- Independent fishermen are residents of Messolonghi, Etolico and Neochori.
- Independent fishermen are always allowed to fish in unleased areas.
- Both groups only have access/fishing rights to their respective areas of the lagoon.
- The cooperatives have the right to regulate access to their portion of the lagoon, which is limited in length to the 12.5 km wide mouth of the lagoon and in width to 350 meters.

### 3. Choice Rules:

- The governor of the province may lease all or a portion of the lagoon to cooperatives and businessmen for a period of 10 years.
- The Minister of Agriculture can choose to supervise the activities in the lagoon (inferred).
- The cooperatives must comply with the permissible gear requirements stipulated in the written leasing contracts with the government.
- The cooperatives must pay 25% tax of the gross value of their catch.
- The cooperatives must have a minimum number of members.

- Cooperative fishermen may borrow money from the bank to offset the high capital investment and operating costs of their fishing operation (fences, traps, and gasoline).
- Any businessmen who may lease fishing grounds must pay an annual fixed sum to the government.
- The cooperatives must not fish and the independent fishermen may fish in the unleased areas of the lagoon.
- The independent fishermen must not and the cooperative members may fish in the cooperative fishing grounds.
- The independent fisherman may fish in the unleased portion of the fishing grounds on a no-fee basis.
- The independent fishermen may not use motorized boats and can only use long-lines and spears without lights, except from the beginning of November through the end of March when they can fish with spears and lights.
- All fishing is prohibited within a zone of 500 to 1,000 meters from the mouth of the lagoon towards the Patraikos Gulf (the zone is wider for trawlers)

#### **4. Aggregation Rules:**

- Cooperative fishermen determine whether to completely remove the fences and traps from the river mouth or to leave them there over the summer.
- Cooperative fishermen decide whether to use traps with very fine mesh that prohibits the escape of smaller size fish. .
- Both cooperative and independent fishermen determine whether to fish close to the mouth of the lagoon.

#### **5. Payoffs Rules:**

- The fishermen members of the cooperatives pay 25% of their gross income as a lease fee to the government.

#### **6. Scope Rules:**

- There is no mention of scope rules in the original case study.

#### **7. Information Rules:**

- Cooperative Fisherman must declare their catch to pay a tax (25% of total catch), however cooperatives declare a lower catch than the actual one.

### **1.5 Summary**

Cooperatives are leased fishing grounds near the lagoon mouth for a period of ten years. Cooperative fishermen make large capital investments to set fences and traps to catch fish, and they are required to pay a 25 percent tax on the gross value of their catch. Most of these cooperatives circumvent the government's minimum membership requirements by having family and friends register who then don't work for the cooperative. The independent fishers on the other hand have unrestricted fishing rights over the unleased areas of the lagoon mouth on a no-fee basis. Independent fishers are denied membership in the

cooperatives even though they may desire membership and their qualifications fulfill the eligibility criteria of the cooperatives. Furthermore, they are not allowed to use motorized boats, although most of them use them illegally. Most of the independent fishermen hold secondary jobs at factories for additional income. Poverty is high in both fishing groups.

Members of the cooperatives feel that the independent fishermen free-ride on the capital investment and other efforts made by the former to develop the lagoon for fisheries. The independent fishermen feel the cooperative members are elite groups who use their power to influence decisions in their favor and not allow the former group to prosper. Therefore, there is a strong competition between these groups due to contrasting interests. This competition often leads to conflict, violence, and rule-breaking which negatively impacts the ecological conditions in the lagoon.

## **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.

## **3 Part III. Case Contributors**

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