Baccalaos Cove Cod Fishery, Canada

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1 Part I: Static Analysis - Collective action

The inshore fishery is nested alongside the rural fishing settlement on Newfoundland's Burin Peninsula, Baccalaos Cove. The key resource system is the Northwest Atlantic marine ecosystem. The key common-pool resource unit relevant to the commons dilemma faced by the community is cod fish. The original case spans 1977-1979 and reports about 81 fishermen among 1100 residents, though this does not include those fishing for household consumption. Community fishing practices and the seasonal variation in cod populations have been successful in maintaining the cod resource and its fair distribution among households (inference). The lottery system introduced in 1962 supported the fair distribution of cod among fishermen but may create an overfishing risk. The original case was considered successful in managing the shared cod fish resource.

1.1 The Commons Dilemma

- The Baccalaos Cove inshore cod fishery is potentially impacted by competition among fishers and the risk of overfishing. A lottery system to select cod fishing berths was introduced in 1962, granting crews legal rights to their selected berths. A Lottery Committee controls the site selection for trap berths in the summer for fishermen crew. Between 1956 and 1964, Newfoundland saw an increase in inshore cod fishermen and a corresponding decrease in average catch per fisher (Dunne, 1970). In the years leading up to the lottery system's adoption, it is thus possible that competition among inshore cod fishers increased. According to the original case, fishermen prior to the lottery system still respected informal claims to berths. However, some fishermen say the lottery system protects their berths. The original case also suggests that the lottery system may increase the risk of overfishing since the Lottery Committee enters the cove's best berths into the drawing pool every year.

1.2 Biophysical Context (IAD)

- **Natural Infrastructure:** Baccalaos Cove is isolated and was not settled until the late 17th century. According to the original case study (Powers 1984) the Burin Peninsula is approximately 106 miles long and at its widest point, 15 miles across bare rocks form most of the shoreline outside the harbors and small coves. The Baccalaos Cove is a fishing settlement in Placentia Bay on the eastern shore of the Burin Peninsula of Newfoundland. It is situated at the head of a long narrow inlet which provides a deep, well protected natural harbor. A natural breakwater near the head creates an inner harbor which provides added shelter. The resource unit is

Northwest Atlantic cod, which feed on smaller capelin fish. Cod populations are highest in the summer and lower in the fall fishing season.

- **Shared hard human-made infrastructure:** The original case study notes (Powers 1986), the 42 berths, which are located near a rock or a body of land to allow the fishermen to attach their traps, range in depth from 12-16 fathoms of water and are contiguous. In 1977, 33 berths were placed in the lottery.
- **Private hard human-made infrastructure:** The case study does not note how many total cod traps are present within the inshore fishery berths, nor does it state the exact number of boats, cod traps, nets, hand lines, jiggers or other gear. However, since the case study does only reference two boats with loran and radar, it can be inferred that most of the vessels are small and without any large scale technological competitive advantages.

1.3 Attributes of the Community (IAD)

- **Social infrastructure:** While the right to fish, broadly speaking, is not restricted to community members, and agnates, there are strong social norms that limit the participation of outsiders in local fishing crews. The right to trap fish in berths, however, is legally determined by the lottery system. According to the original case (Powers 1984, pg 95), the Lottery Committee, chosen by a vote among the fishermen, selects the berths entered according to the number of crews that will be fishing that year and is supervised by a representative from the Department of Fisheries of Canada.
- **Soft human infrastructure:** There were approximately 1,100 residents at the time of the case study and it was estimated that 81 were traditional fishermen, though this likely discounts very small-scale fishers. From the source document (1984 Powers) in 1977 in the summer there were 11 trap crews (59 men) and 9 crews (20 men) fishing without traps with an additional two men fishing alone. During the fall season, 20 small non-trap crews, made up of 49 men, and one lone fisher were active.

1.4 Rules in Use (IAD)

- Position Rules:
    1. The cod trap crews are the resource users within this system.
    2. Among crewmembers, there are shareholders, who are equal partners, and sharemen, who receive a fixed share.
    3. The skipper is the captain of the crew.
    4. Members of a “crowd,” are part of a group with title to land, waterfront, and fishing stages.
    5. The Lottery Committee members select the berths to be entered into the lottery every year.
    6. The existence of the position property owner
- Boundary Rules:

1. Those who own or have access to a sea facing property, typically through the patriline, have the rights to fishing stages and sea.
2. Membership of a crowd is primarily patrilineal, but sometimes a non-agnate can enter the crowd through marriage to a female with use rights of waterfront property.
3. Members of the crowd assume the position of shareholders in fishing crews whereas non-crowd members are sharemen.

- Choice Rules: The case study did not mention obvious choice rules. But implied choice rules are
    1. Skippers and crews may set traps in their assigned berths.
    2. Crews may utilize other berths that have not been placed in the lottery or not been claimed by the lottery end date.
    3. Trap crews may move into berths used by non-trap fishermen in exchange for a share of the trap haul.
    4. Fishermen may vote for lottery committee members.
- Aggregation Rules:
    1. The Lottery Committee is selected by the fishermen's votes (not clear if it is a majority or unanimous vote)
    2. The Lottery Committee determines which berths are placed in the draw each year.
    3. Although the crew discusses which berth to choose in the lottery together, the skipper makes the ultimate decision.
- Scope Rules:
    1. Trap berth areas are designated for those fishermen using traps to catch and haul the fish and while their locations are known by all the local (and neighboring outport) fishermen, their use by trap fishermen only is known and accepted.
    2. According to the original case document (Powers 1984), there is no legally sanctioned lottery system for the fishing grounds exploited by those fishermen using hand lines, nets and jiggers or trawls.
- Information Rules: The case study did not mention obvious information rules. But an information norm is that fishermen with radios, radar & loran keep their communications and sites secret to other fishermen and especially strangers.
- Payoff Rules: The case study does not mention pay off rules.

1.5 Summary

The success of the Baccalaos Cove inshore fishery can be attributed in large part to the social norms, kinship organization, weather & seasonal fishing limitations seem to keep the inland fishery manageable and keep it from being overfished (inference). Interestingly, the case study notes that the introduction of the lottery for berth traps actually might have introduced exogenous stress on the system because it eliminated what was previous

ecological randomness and balance which prevented the fish supply from becoming depleted, while still providing the fishermen with a good voyage because before the lottery some very good berths were not regularly exploited through each fishing season.

2 Part II: Dynamic Analysis - Robustness

Although there has not been a follow-up on the Baccalaos Cove inshore fishery since the original case in 1984, we can infer some aspects of the system's robustness. Since the fishery's establishment in the 19th century, Power (1984) states that the social and economic organization of the community has not significantly changed. This is despite changes that drew people to other employment opportunities, including the opening of the fluorspar mine in St. Lawrence in the 1930's or government-offered education and job training opportunities. The system was able to adapt in such situations by adjusting the boundary rules for fishing crews and taking on more sharemen within the community.

However, it is possible that the system's ability to adjust these exogenous factors was made possible by its relatively small scale. In addition to the kinship organization and seasonal factors discussed earlier, economic relationships and social norms have also constrained fishing activity in Baccalaos Cove. Outside cod merchants keep fishermen in a debt-credit cycle by offering credit for cod in the form of nonlocal goods, supplies, and fishing gear. As a result, fishermen have limited availability to invest in new technology and gear. Financial constraints aside, community values of egalitarianism also deter "entrepreneurial interests," (Power 1984, pg 148) such as investing in gear to maximize fishing hauls. Finally, although the community was able to slightly relax its boundary rules to accommodate changes in crew member availability, it maintains a strong skepticism towards strangers and is unlikely to integrate individuals outside of the community. Given these constraints to its size and scale, the Baccalaos Cove inshore fishery is likely only robust to minor population or market disruptions. It may be vulnerable to more acute disruptions, such as significant population change, price fluctuations, or technology growth.

3 Part III: Case Contributors

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