The Discovery Bay Fisheries Improvement Project: A Status Report

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INTRODUCTION

This paper describes the evolution, current status, and some of the findings of the Discovery Bay Fisheries Improvement Project. The project began with a simple awareness that an overfishing problem existed, and the belief that grass roots, community based action was the desirable way to address the problem. Although our basic philosophy is unchanged, the project plan has been modified in response to knowledge gained in the process of making the project operational and difficulties in staffing the project. Our research to date indicates that both economic and biological overfishing exist. The former drives the latter, and the structural barriers to remedial action are formidable.

The Project is visualized as the beginning of a long-range programme to investigate the potential of community based management of Jamaican north coast reef ecosystems. Most, if not all of these open access, common property ecosystems exhibit severe and chronic symptoms of economic and biological overexploitation, exacerbated by the effects of natural disasters. The underlying assumption is that with appropriate management measures, ecosystem damage will be minimal, and both fishing communities and the marine oriented segment of the tourism industry will be economically better off.

The project focuses on the Discovery Bay reef fisheries and related ecosystem components. The objectives of the project are:

1. Through biological and social science research, to delineate, describe, and monitor the relevant biological and cultural systems.
2. Through a two-way education/communications program, to exchange knowledge between fishing community members and researchers.
3. To use the knowledge gained and the knowledge transfer processes themselves to motivate and empower the users towards collective action to improve the status of the resource. This action will be aimed at devising and, in the long run, installing, by direct or indirect means, measures to manage reef fisheries.

The approach used is itself developmental, and the third and most important objective is particularly problematic given the refractory problem being tackled, and the short time span of the project.

DESCRIPTION OF THE DISCOVERY BAY FISHING COMMUNITIES

North coast Jamaican fishing communities have a very limited area available to them for fishing (Figure 1). They are constrained on the one hand by the narrow shelf, which limits coralline reef production, and on the other hand by interactions with adjacent communities which determine how far they can move along the coast, and which gear they can move with. These latter interactions seem to comprise three main types:

1. structural competition, which results in depletion everywhere along the coast, so that there is little advantage to travelling very far to fish;
2. competitive rivalry, in which active interference with gear occurs;
3. cooperation based on respect for the traditional territories of others.

The relative importance of these three components seems to vary inversely as the vulnerability of the technology used to detection and interference (fish pots being most constrained, then set nets, hook and line, drive nets, and spearing).

THE "OVERFISHING" PROBLEM

The Discovery Bay fishing communities of Top Bay and Old Folly are caught in a vicious circle of economic overfishing leading to biological overfishing, which in turn exacerbates economic overfishing. The situation seems to be driven by the needs of a burgeoning population for protein and cash income, coupled with open, easy access to the resource. The result is a free-for-all competition for the resource in which it is exploited at a rate faster than the production rate. The irony is that a reduced exploitation rate could significantly improve both the economic and biological yields of the fisheries involved, and allow the participants more time for other activities. The challenge is to achieve this improvement, and the main barrier seems to be poverty. This can be alleviated only through economic development to relieve the pressures driving participants into the fishery. Education is a corequisite, both for economic development, and to ensure that this development is sustainable. The main goal of this project is to educate both the fishing community and ourselves to the nature of the problems faced, and the benefits to be gained through collective action to implement sound management measures. The elements contributing to the central problem are presented in this section.

CONTRIBUTING FACTORS

Luring Participants into the Fisheries

1. High market demand of seafood, which assures participants in the fisheries of the sale of their catch

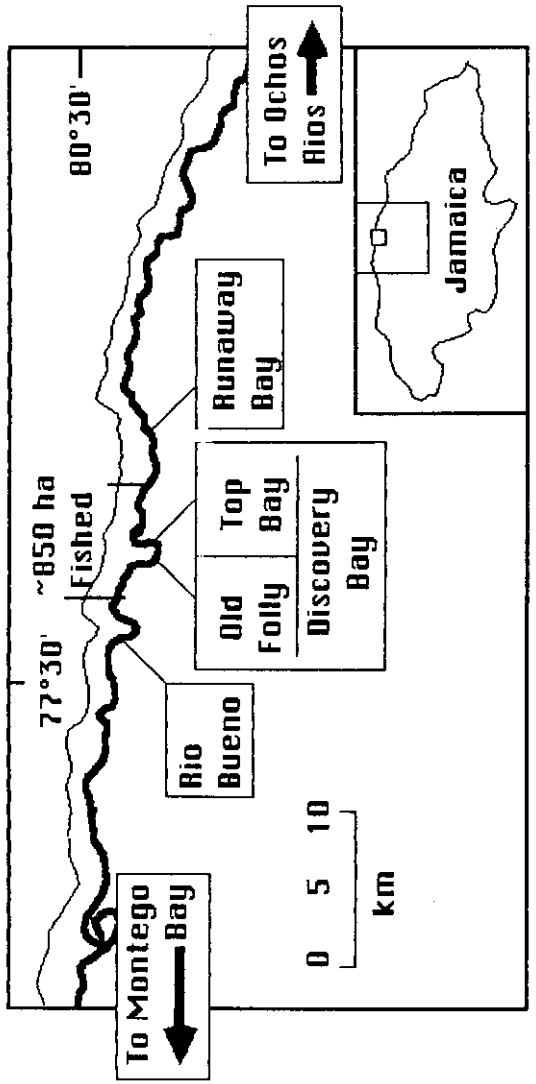


Figure 1. Community fishing grounds are constrained:
1. Narrow Shelf
2. Community interactions:
- structural competition
- rivalrous competition
- cooperative avoidance (Respect)

Figure 1. Community grounds are contained: 1. Narrow Shelf, 2. Community interactions: a) structural competition b) competitive rivalry c) cooperative avoidance (Respect)

2. Immediate cash return for fishing effort
3. High visibility of the fishermen who are making good money
4. High cultural value placed upon fishing skills
5. High cultural value placed upon certain lifestyle attributes of fishing

Forcing Participants in and Keeping Them in

1. Few fast payback income earning alternatives; fishing is one of the few ways of earning a cash income and putting food on the table (This is another way of saying opportunity costs are low, and it is important enough to break it out on its own)
2. Poor formal education and training, which limits employment possibilities
3. High unemployment; many are forced into fishing as the economic opportunity of last resort
4. Poor pay in other jobs; many employed individuals fish part time

Allowing entry

1. Open access to the fisheries, which in principle permits anyone to enter
2. Low entry costs: the equipment needed can be very inexpensive; both equipment and operating costs may be government subsidized; and opportunity costs are low
3. Easy physical access to the resource due to the narrow coralline shelf

Perpetuating Destructive Competition

1. The fugacious nature of a resource which is largely invisible in its natural state
2. Stochastic temporal variation and consequent uncertainty about the status of the resource and one's expectations about economic returns
3. The common perception that fish in the sea belong to whoever can catch them first, and that everyone has a right to fish
4. Fishing as a competitive game in which fish are the scoring markers
5. Anyone increasing fishing effort will benefit at the diffused expense of the other participants
6. Conversely anyone acting unilaterally to reduce his fishing effort will bear the costs of so doing, whereas the benefits will be diffused across all members of a particular fishery
7. Mistrust among fishermen, especially among groups that fish the same stocks but are different in terms of gear used, vulnerability to theft, and possibly some other descriptors such as age, and beach fished from
8. The individualism of fishermen, which inhibits cooperation for collective action without which there is no solution

9. Short-run costs that discourage action, even if all fishermen could agree on collective measures to reduce fishing effort
10. Belief that the causes of the decline in the fisheries lie completely outside individual control, means that there is no incentive for which behavioral change on their part even when the belief is incorrect or only partially correct
11. The presence of a substantial reserve pool of potential fishermen who are presently inactive and who do very little fishing but may be lured in by apparent improved profitability of the fishery
12. Contributions to the home economy, due to occupational pluralism and remittances from abroad, which allow many fishermen to participate in what otherwise would be a marginal or even money losing occupation

Underlying and General Factors

1. Natural population growth, which fosters both increased demand for fish and increased numbers of fishermen
2. External economic factors, for example:
   i. The cuts in the Canadian cod quotas has redirected production of cod product away from the low end, which has reduced the quantity of salt cod available to the Caribbean, raised its price, and increased the incentive to fish local fish species more intensively.
   ii. The decline in the Jamaican dollar (about 20% vs US) since August 1989 has further increased the cost of imported fish products, imports in general, and of local production as well. As a result the real incomes of Jamaicans has declined, further increasing the incentives to go fishing.
3. The possibility that any of the general factors believed to cause coral reef degradation have indirectly contributed to the decline of the fisheries
4. The possibility that biological overfishing is a factor inhibiting the recovery of hurricane ravaged reef-building corals, and that this in turn is affecting fish populations
5. The reluctance of politicians to enact unpopular legislation to control fishing effort
6. The inability of government to afford the costs of effectively monitoring fish stocks and enforcing regulations; perhap the costs would exceed the benefits

RESULTS

The Discovery Bay fishing communities of Old Folly and Top Bay interact with each other, and with Rio Bueno to the west and Runaway Bay to the East. The area fished seems to be about 850 ha (Figure 1). Tentative estimates indicate yields of about 49 kg/ha/yr for this area.

The two Discovery Bay fishing beaches are very different in physical and social aspects (Figure 2). Top beach is sandy with trees and a large gear shed. The trees to the east shelter the beach, and during most of the day, there are plenty of shaded areas. There is a beach bar and vendors selling drinks and food. Fishermen tend to do work such as building traps on the beach and to socialize on the beach. Old Folly, by contrast, is exposed directly to the sun and the wind, and the beach itself is composed of large gravel and cobbles which often get shifted by the waves making it necessary to dig out channels to land boats. There is little socialization on this beach, and the only work done there is that which is necessary to repair boats and clear landing areas of large rocks washed up by wave action.

More fish are landed on Top Beach, and this attracts both consumers and fish vendors. Most of the fish on Old Folly are sold to the two restaurants across the way, or on contract to members of the community. Possibly due to the proximity of Old Folly to a large employer (Kaiser Bauxite), there is a larger proportion of part-time fishermen operating out of Old Folly.

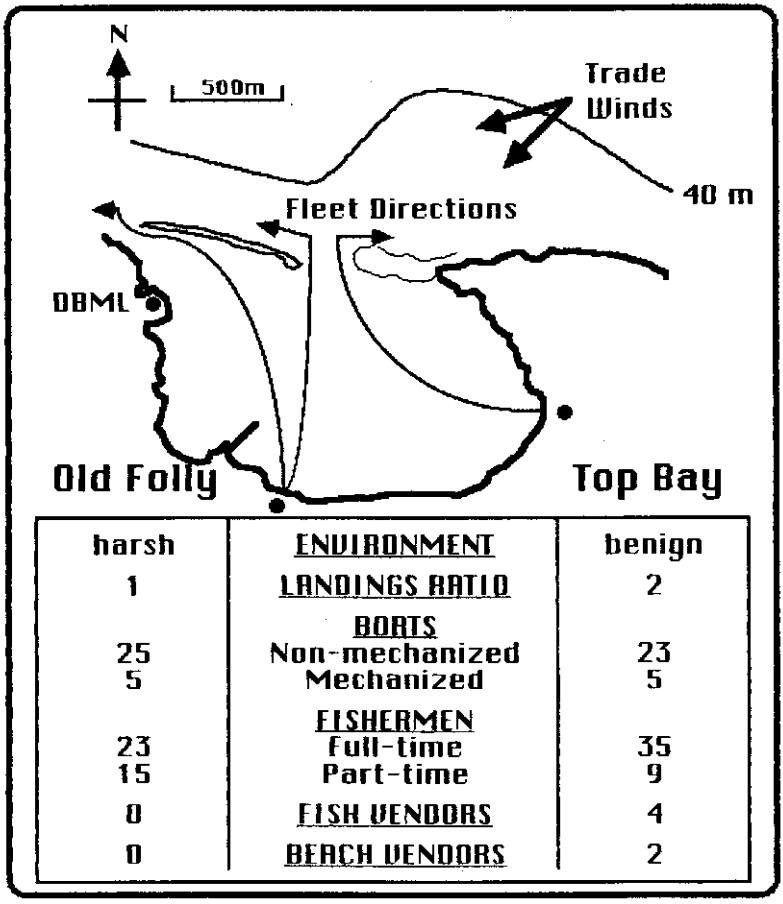
The gear mix used on the two beaches is different, with more spearmen operating from Top Bay and more hook and line fishermen at Old Folly. A small group of drive net fishermen work out of the Old Folly community, and they appear to be one of only two drive net groups on the north coast (and possibly on the island).

APPENDIX 1: STAFFING PROBLEM

This topic is appended because it is not unique to this project. It is hoped that it will alert project planners, so that they may avoid similar difficulties in the future. The project has had serious difficulties hiring staff, primarily because the salaries offered are too low. There seem to be two reasons for this:

1. The salaries at UWI are lower than private industry (especially for entry level positions);
2. Jamaicans are reluctant to relocate to Discovery Bay from Kingston without financial compensation for doing so, because they incur substantial real increases in their cost of living by relocating to the relatively isolated north coast Discovery Bay Lab.

The resulting short-staffing has hamstrung the project, delaying the start for two years and interfering with data gathering, analysis, and planning since start-up in September 1988.



harsh	ENVIRONMENT	benign
1	LANDINGS RATIO	2
	BOATS	
25	Non-mechanized	23
5	Mechanized	5
	FISHERMEN	
23	Full-time	35
15	Part-time	9
0	FISH VENDORS	4
0	BEACH VENDORS	2

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