Some Lessons From the Jamaican Reef Fishery

K.A. Aiken
University of the West Indies, Mona, Jamaica

CARIBBEAN FISHERIES MANAGEMENT COUNCIL PUERTO RICO

FISHERIES CONSERVATION CONFERENCE. LA PARGUERA,

PUERTO RICO: 22 - 24 OCT. 1991

" SOME LESSONS FROM THE JAMAICAN REEF FISHERY"

K.A.AIKEN

UNIVERSITY OF THE WEST INDIES, MONA, JAMAICA.

CONTENTS:

1. Background-
    a. Fishing operations
    b. Fishing gear
    c. status of fisheries
2. Conservation recommendations
3. Enforcement problems
4. Present status
5. Existing Management projects.
6. The Future.
7. Other observations.

FORMAT-

a. General introduction
b. Slides
c. Overheads.
d. Conclusion.

SOME CONSERVATION LESSONS FROM THE JAMAICAN REEF FISHERY

Background.

In order to fully grasp the different types of conservation problems in the Jamaican fishery, it is first necessary to briefly examine the organization of the fishery. Fishing Areas;

The present fishery of Jamaica is essentially artisanal, that is, it is not highly technologically developed and is conducted by fishermen in small vessels. There are ap[p]roximately 12,000 full-time and another roughly 5,000 persons who would fall into the category, part-time fishermen. Up to the end of 1990, there was a total of 212 known fish landing sites around Jamaica (Espeut & Grant), and 76 % of the total annual landings from the inshore fishery came from the South coast.

The fisheries activities of Jamaica may be divided into two main sectors, a. Inshore and b. Offshore.

(SEE FIGURE 1).

A. The Inshore fishery:

This is carried out on the island shelf (see **figure** 1), the south shelf has a maximum width of approximately 24 km (15 miles) south of the parish of Saint Catherine, while the north coastal shelf is very much narrower and does not exceed 1.5 km (1.0 mile) in width at any point. The island shelf is approximately 1,853 square km (1,000 square miles) in area. It should be noted that the inshore fishery includes all the immediately adjacent banks (see figure [sic]) which include nine such banks. These banks are more than 64 km (40 miles) from the mainland and access to them is by outboard - powered canoes which, according to Sahney (1982) comprise about 54 % of all boats in the fishery.

Historically, the shelf and the proximal banks have supported the bulk of fishery activities in terms of manpower and vessels.

B. The Offshore fishery;

This sector includes all those activities carried on outside the zone of proximal banks i.e. roughly in excess of 64 km (40 miles) from the mainland, including the larger banks, e.g. Pedro Bank and Morant Bank and in distant extra-territorial waters,

i.e. outside of national jurisdiction. Up to about 1977, there was an extensive mother - boat trap fishery in the Colombian archipelago (Serranilla Cays, Banco Nuevo, Serrana Bank and Quita Sueno Bank) some 250 miles(km) southwest of Kingston. (See figure).

Fishermen are based on the Pedro and Morant Cays, a group of very similar cays on the southeastern fringes of both banks. They supply carrier vessels (larger decked vessels up to 20m LOA) from Kingston ,with primarily trap-caught fishes in exchange for cash, fishing materials and living requirements.

2.0 FISHING GEAR.

As in Puerto Rico, the main gear is the fish trap or fish pot (See Figure), and in Jamaica accounts for approximately 54 % of all catches . The other types of gear are in order of importance;

Nets (23 %)

Hook and Line (19 %)

Spearfishing (approx. 2 %)

Illegal methods (dynamite, poisons), (about 1 %)

The traps used in Jamaica are usually called Z-traps or Z-pots and are usually covered with hexagonal wire mesh with a minimum aperture of 3.18 cm (1.25 inches). The average Jamaican Z -type fish pot measures 230 x 120 x 60 cm (7x4x2 feet).

(See Figure)

3.0. STATUS OF FISHERIES.

In Jamaica the demand for fish and fish products is very great and growing. The local marine fishery supplies only approximately one-third of the total demand. Additionally, unemployment is high and-fishing is one of the few job opportunity options for a large segment of the coastal population. At the same time, the fishing industry is subsidized by the Government and the fishery and the fishery is essentially an open access one.

The consequence of this is that there is increased competition for the existing fishery resources. Historically, the fishery has been comprised of numbers of fishermen operating from a large number of small scattered sites. In the period up to about 1957, these were all unmechanised. Since about that time (1957), there has

been increasing use of outboard engines and since about 1970, an increasing number of slightly larger fibreglass canoes.

3.1. CONSEQUENCES OF OPEN ACCESS AND RAPID GROWTH.

At the present time, and probably for some time previously, approximately 95 % of the full-time fishermen operated on the inshore fishing grounds and these fishermen produce about 88 % of all landings.

FISHING EFFORT;

Available information shows that between 1968 and 1981, the total number of canoes increased by 21 % but the real or **Effective canoe effort actually increased by 85 % ,** mainly due to a **93 % increase in** the number of **mechanised canoes.** (SEE FIGURE [sic]).

CATCH PER UNIT EFFORT ;

From Figure [sic], we can see that there was a steady decline in the catch per effective canoes. The calculated rate of decline is about 130 kg per canoe per year. If we use 1968 as the base year, by 1973 the catch per canoe had fallen to 84 % and by 1981, to 59 % of the 1968 figure.

FISHING INTENSITY AND CATCH EFFECTS;

Figure , (calculated catch curve acetate) shows that a maximum yield of approximately 2,100 kg / sq.km /yr. was attained by a fishing intensity of about 0.75 mechanised canoe /sq.km.

It is suggested that the data indicate that in 1968 the inshore fishery was generally underexploited. By 1973 the fishing intensity had increased to about 0.6 canoe per square Km. and a maximum yield was being approached. It is estimated that this maximum yield was attained around 1975/1976.

Since then, the fishery has entered a phase of overexploitation characterised by declining catch rates as fishing intensity increases.

CHANGES IN SPECIES COMPOSITION;

There have been significant changes in the species composition of the landings of finfish from the inshore fishery since 1968. These changes are shown in Table 1.(acet) The table shows that the percentage ,composition by weight of higher valued species (" Quality") fish such as snappers appears to be decreasing; while the percentage of lower valued species (" Common" and "Trash") categories, including such fishes as squirrelfish, surgeonfish and parrotfishes, appears to be decreasing.

Also implied are the more subtle changes in the trophic relationships of the coral reef fish community.

DECREASE IN MEAN SIZE OF CATCHES;

Although there is no statistical data for this , we feel from repeated visits to the field, that , in addition to the above changes, there is also an accompanying reduction in toe mean size of the fishes landed generally. Many persons in the fishery also share this view, especially regardin[g] the period since about 198O.

STATUS SUMMARY

The available data suggest that the inshore fishery of Jamaica is well into an overfishing phase. The fishery is typified by falling catch rates, static total catches and declining catch value due to species changes trending toward those of reduced market value. Lastly, we feel there is a tendency towards reduced mean sizes of fish landed.

In short, the Jamaican fishery is in crisis and in urgent need of management and control.

4.0. INFORMING THE AUTHORITIES OF THE PROBLEM.

There have been several conferences, workshops, and discussion sessions both in Jamaica and outside of it at which there were many opportunities for interchange of opinions and options for action with regard to the status of the fishery and its management.

Since 1974 when the many publications by J.L.Munro and his co-workers (including the writer), suggested that the

fishery was not producing properly due to trap mesh sizes being less than was calculated as optimal. The reports were all produced by the University of the West Indies and essentially, were politely ignored after the University was thanked by the Government.

About 1977, opportunities for the re-examination of the reef fishery and other (e.g. pelagic) resources with neighbouring countries (Cuba) and with others outside the region. (the U.S.S.R.) , developed. These re-evaluations essentially, were able to confirm that fishery resources were not abundant and that catch rates were generally low. Still, due mainly to financial constraints, no worthwhile mitigative action was taken about the declining condition of the resources.

All was not completely negative however, as in 1976, regulations governing minimum sizes of spiny lobster and protecting egg-bearing females were introduced. The enforcement of these regulations is another subject for discussion however. These laws were introduced largely it is felt, because the research was done by government fisheries personnel and not those of an external agency. Not of insignificant consequence, was the fact that the researchers were able to continually insist that the Senior fisheries administrators introduce conservation legislation based on their findings.

The Government fisheries administrators were also given other reminders of the deteriorating state of the resources by the FAO/Gov't. of Jam. Potfishing Re-survey of Pedro Bank in 1980/1981. This study generally found that while some portions of this major fishing ground were yielding better than expected catches, the Bank was, for the most part, now heavily exploited. We should note again that this was 1980/81.

More closely to the present, we find that a series of papers by the present author, those of Haughton, and the publication of the 1981 national fishing industry

production survey, all served to demonstrate that all was not well in the artisanal fishery. Perhaps the most, significant finding was that the annual landings had not increased and in tact had now become static at about 17 million pounds or about 7,200 tonnes. This statistic startled many officials much more than the detailed scientific research findings.

Recent research projects (which are actually still operating), on the north and the south coast, both showed that the fishable resources are in poor shape, especially on the narrow north shelf. These findings have been presented at international meetings where the government was represented. They know what the problems are**.** But, enough of the problems, what were the recommendations?

5.0. MANAGEMENT RECOMMENDATIONS.

Bearing in mind the Jamaican fishing industry conditions, it is thought that the measures listed in Table [sic], would be the most amenable to the fishing communities and minimise socio-economic displacements;

1. Gear limitations
2. Fishing effort regulation through a System of Fish Sanctuaries and Closed areas.
3. Resource enhancement (artificial reefs)
4. Catch monitoring or statistical system
5. Establishment of a Fisheries Management Council
6. A Fishermens' Education and Publicity Campaign..

Gear limitations relate essentially to a two-stage introduction of 1.50 inches (4.95 cm) over a one to two year period in an effort to move away from the current.

mesh size of 1.25 inches (3.18cm). Workers such as Munro (1974) and others , all provided evidence to show that increased mesh sizes would have beneficial. long-term effects on catch weight and value.

2. Fishing effort can be identified as a function of four factors,

i. Number of fishing units

ii. Their individual harvesting power

iii. Their spatial distribution

iv. The total time spent fishing.

Thus, in order to alter the total amount of fishing effort, one or more of these components will have been changed. The creation of fish sanctuaries and protected areas is a measure to intended to modify the spatial distribution of fishing effort by easing fishing pressure on the existing resources in selected areas.

3. Resource enhancement by Artificial Reefs is based on the knowledge that if site selection is properly done, then a resident fish population develops after a few months.

4. A catch monitoring and statistical system would enable managers to detetermine the status of the fishery and the effects of management measures that may be introduced. Good fisheries management depends on good monitoring of yields. E. The Fisheries Management Council would have representatives who would provide the following types of information;

i. Gov't. administrative into.

ii. Fisheries biology and statistical

iii. Fishermens' cooperatives

iv. Legal & Enforcement info.

5**.** A Fishermens' Education and Publicity Campaign is a key element to the successful implementation of any management programme. The matter of support for the management measures by the fishermen whom they affect is a real concern and for them to give support they first must know about those measures. This is where community involvement comes into importance and there is now a growing realization of this factor.

6.0 THE RESPONSE;

Generally, the response from the Government has been, to say the least , disappointing. While the administrators would listen patiently, no real changes, for example in the control or restriction of new entries to the overgrown inshore fishery, came about.

On a positive note, we already mentioned that as long ago as 1976, lobster regulations were introduced, though in real terms these have been poorly enforced. Also, in 1993 a Closed Season for spiny lobster lasting for 3 months (April to June), was introduced for the first time. It has proven to be a small step in the right direction.

Let us look at some of the problem areas where the management shortcomings have been greatest.

6.1 Enforcement.

This has been particularly poor and ineffectual as there is no money for personnel for this type of work. Lobster enforcement is perhaps the only good point, in that, with assistance from non-government conservation groups, funds were raised to cover the travel costs of the lone enforcement officer. Nonetheless, it can be

reported to this conference that this one person, did a very good job of visiting the hotels and supermarkets and restaurants all around the coast, but especially in the tourism areas, where demand is greater to inform the operators of the regulations.

6.2. Fines and Disincentives.

Generally, the fines for fishery breaches are too small and these have not kept up with increases (admittedly, this is difficult), but even at the start, they were far too small and were no disincentive at all to would-be offenders.

6.3. Bureaucracy.

This is a major problem in Jamaica and the cumbersomeness of the many and slow steps in getting new regulations introduced is another disincentive to change.

New regulations must be go before the legal draughtsman, then be passed by the House of Representatives and must then be passed by Parliament .

6.4. Political Will.

Most recently, a 1990 socio-economic survey of the fishing industry (Espeut & Grant), put forth the opinion that in Jamaica the fishing industry does not appear to have high Government priority, an opinion shared by many in the industry. This lack of any feeling of urgency, it was said, was demonstrated by the lengthy lag time taken in decision-making and implementation .

There are some of us in Jamaica however that still support the view that the benefits that will accrue from even a rudimentary management programme , far outweigh the multiple consequences of allowing the unmanaged fishery to strangle itself.

Figure 1. Fishing areas of Jamaica and 200m isobath

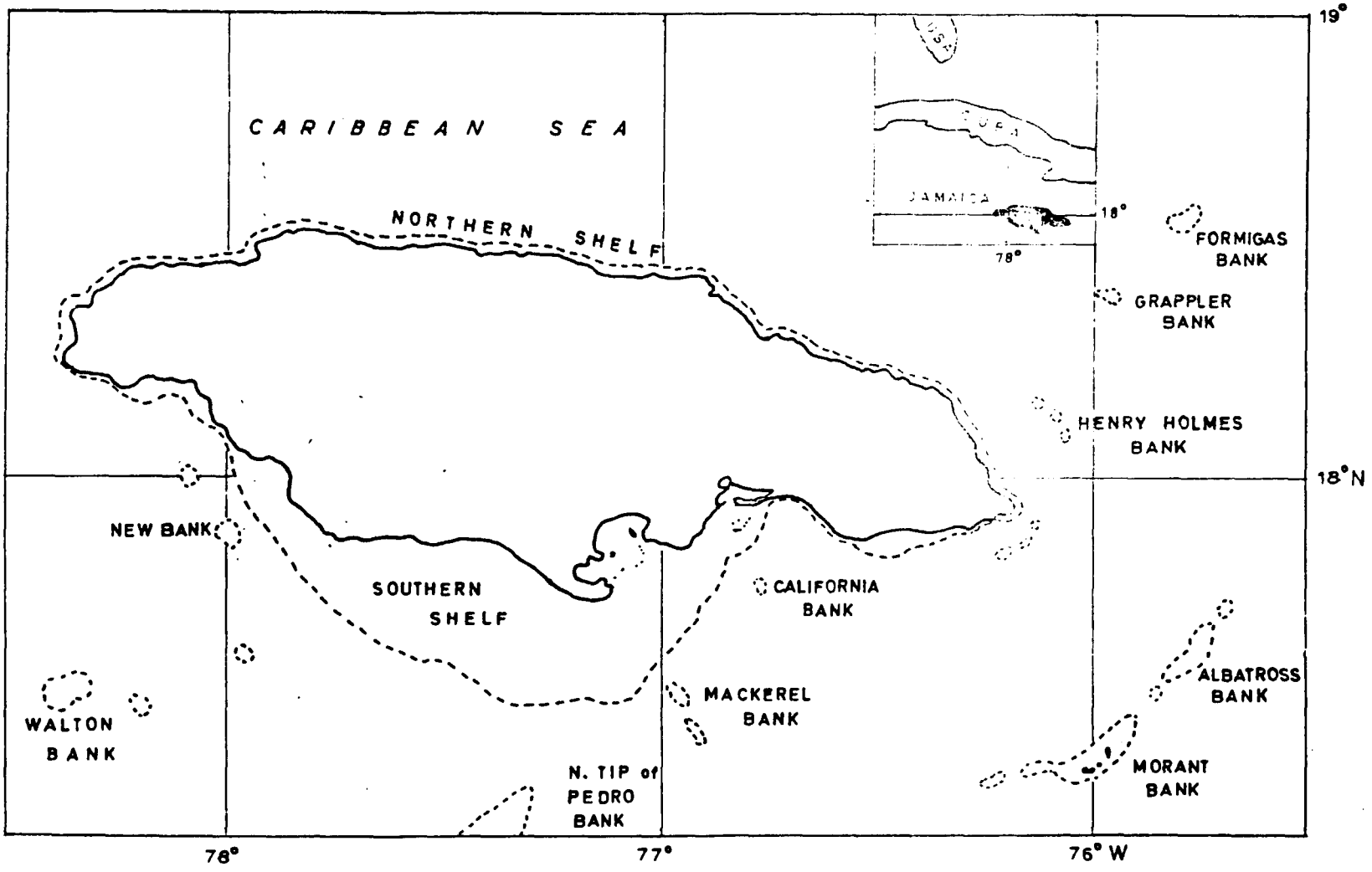
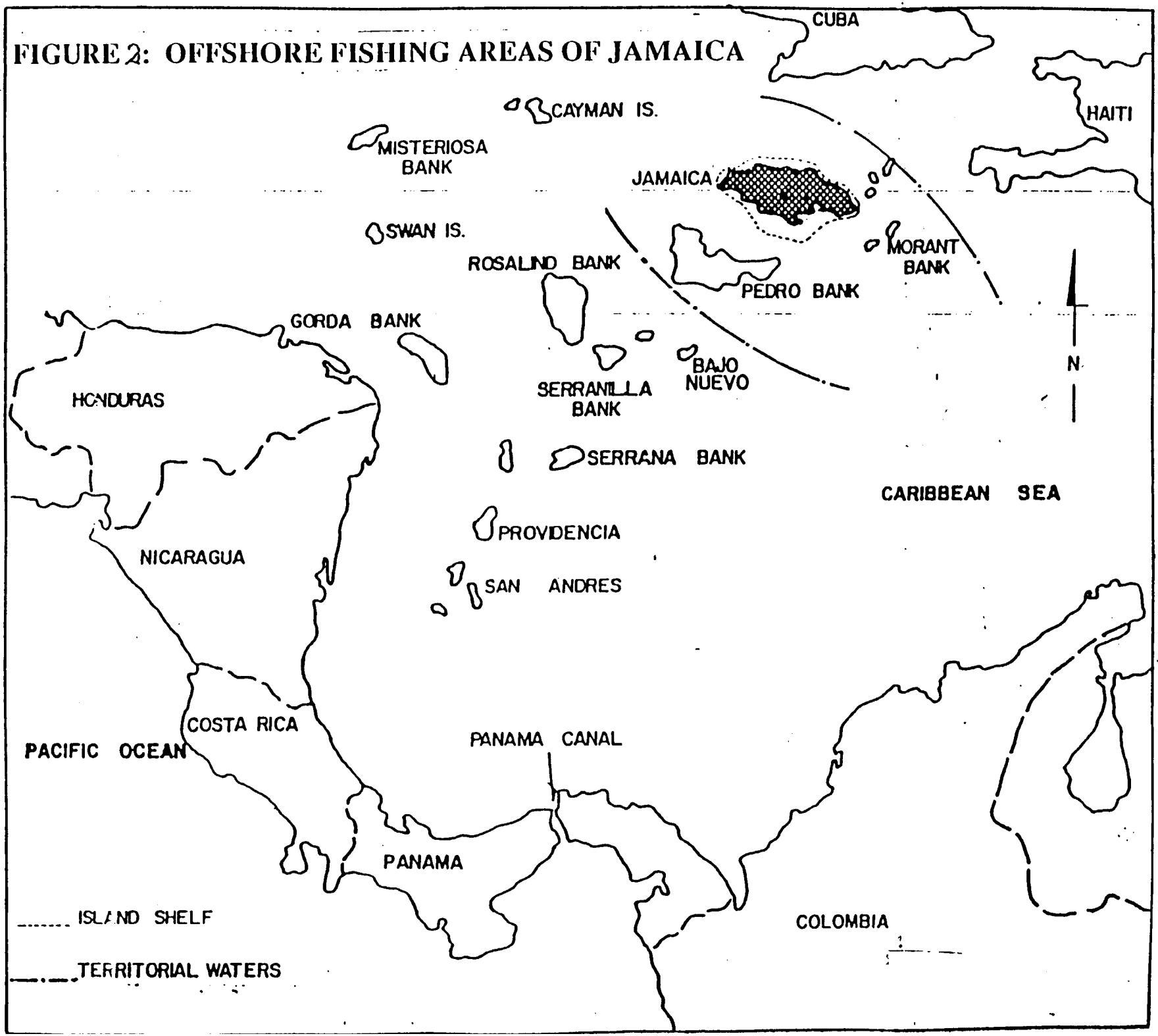
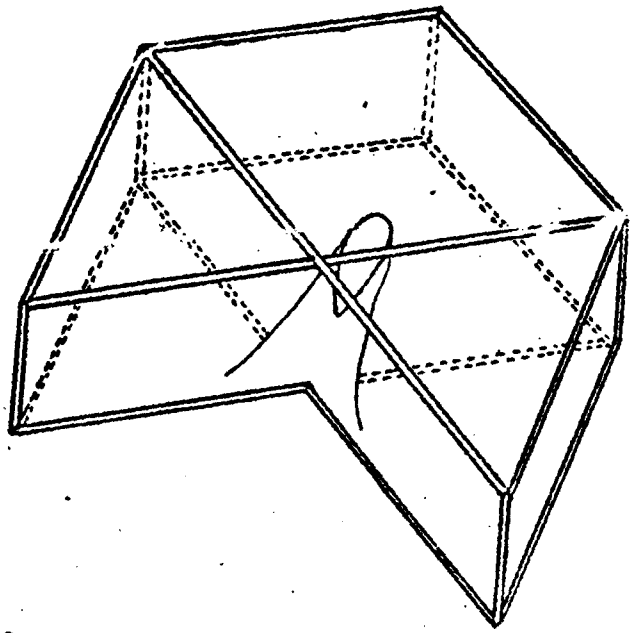
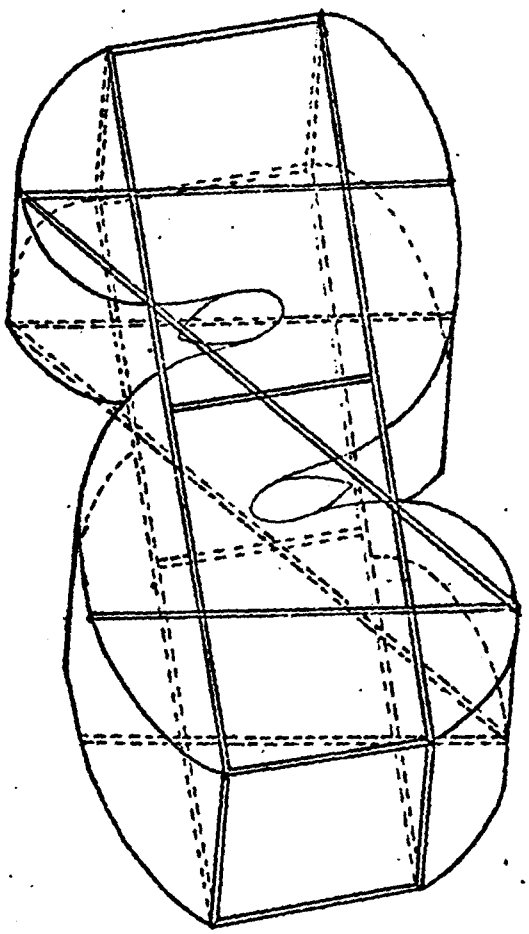


FIGURE 2: OFFSHORE FISHING AREAS OF JAMAICA

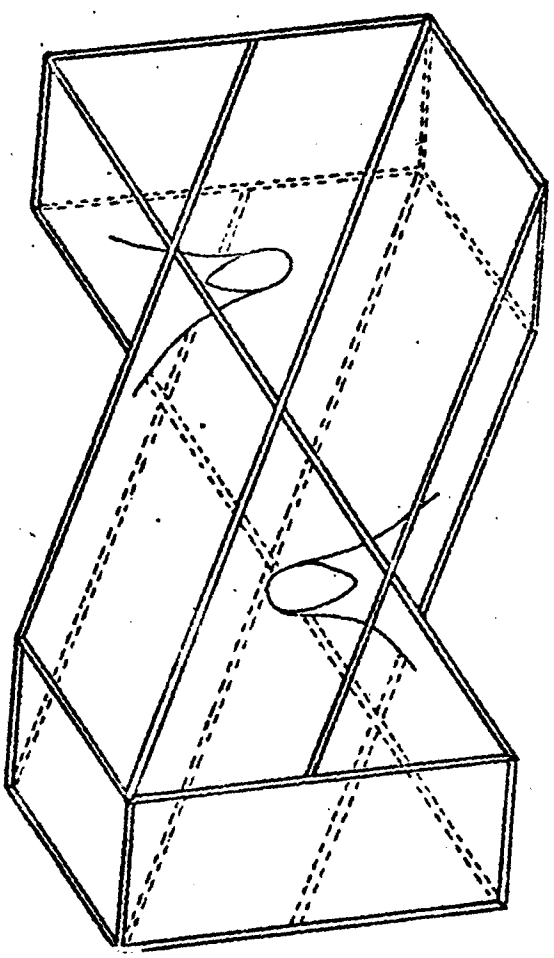




a.



c.



b JAMAICAN Z-TRAP

Figure 4. Changes in effective canoe effort between 1963, 1973, and 1981.

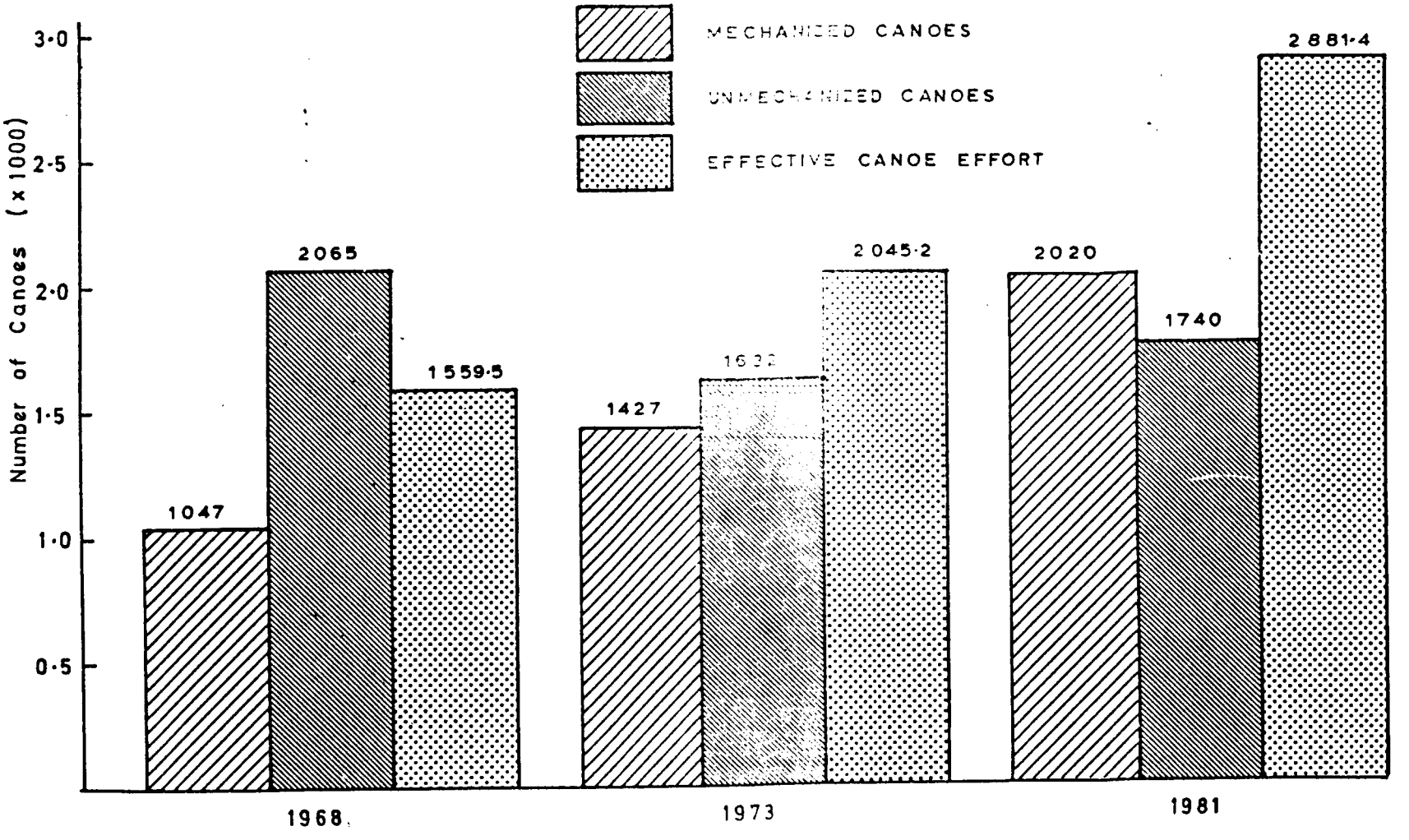


Figure 5. Changes in catch per effective canoe in Jamaica waters with time

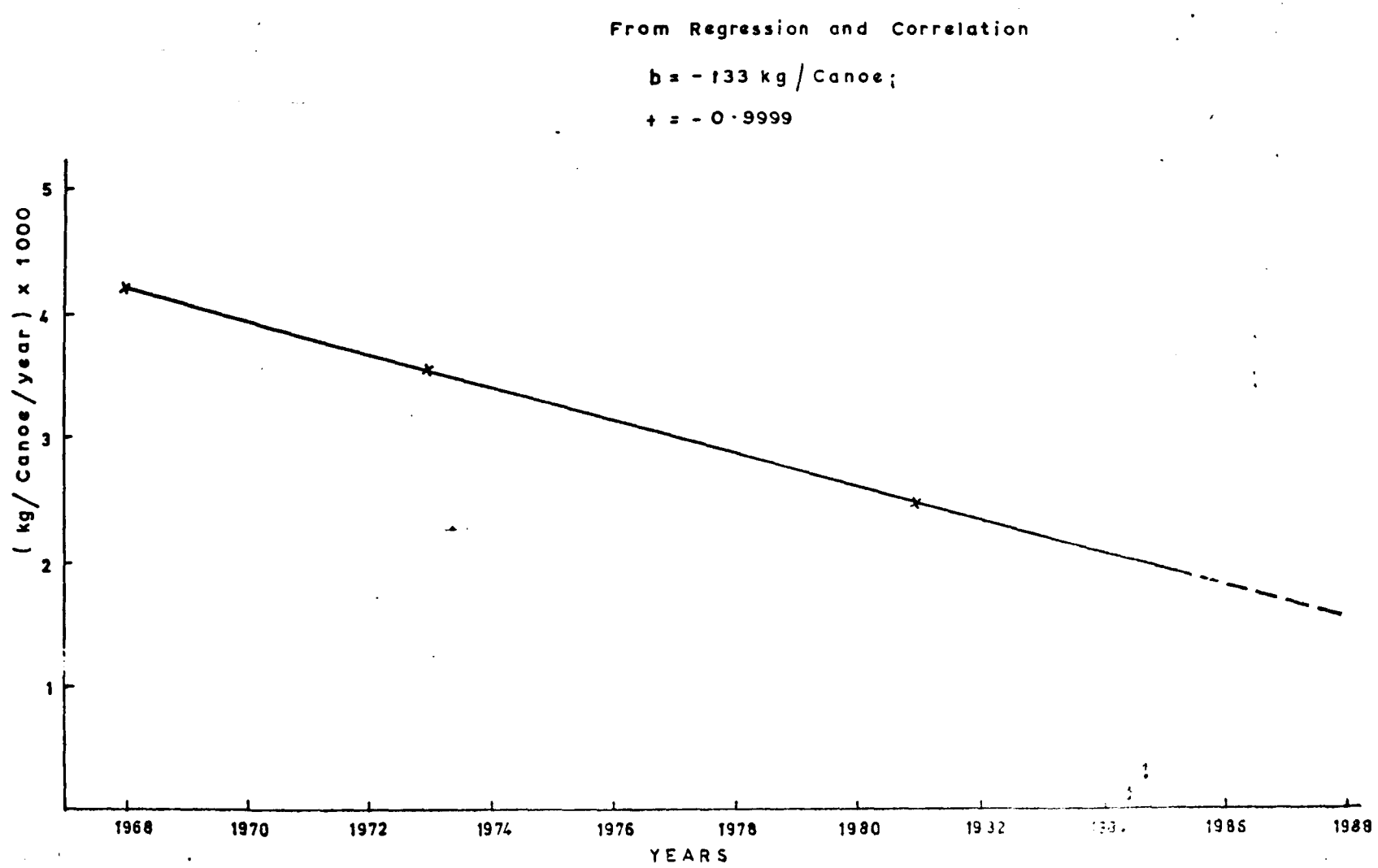


Figure 6. Calculated total catch curve. Note maximum at 0.75 canoes/km^2

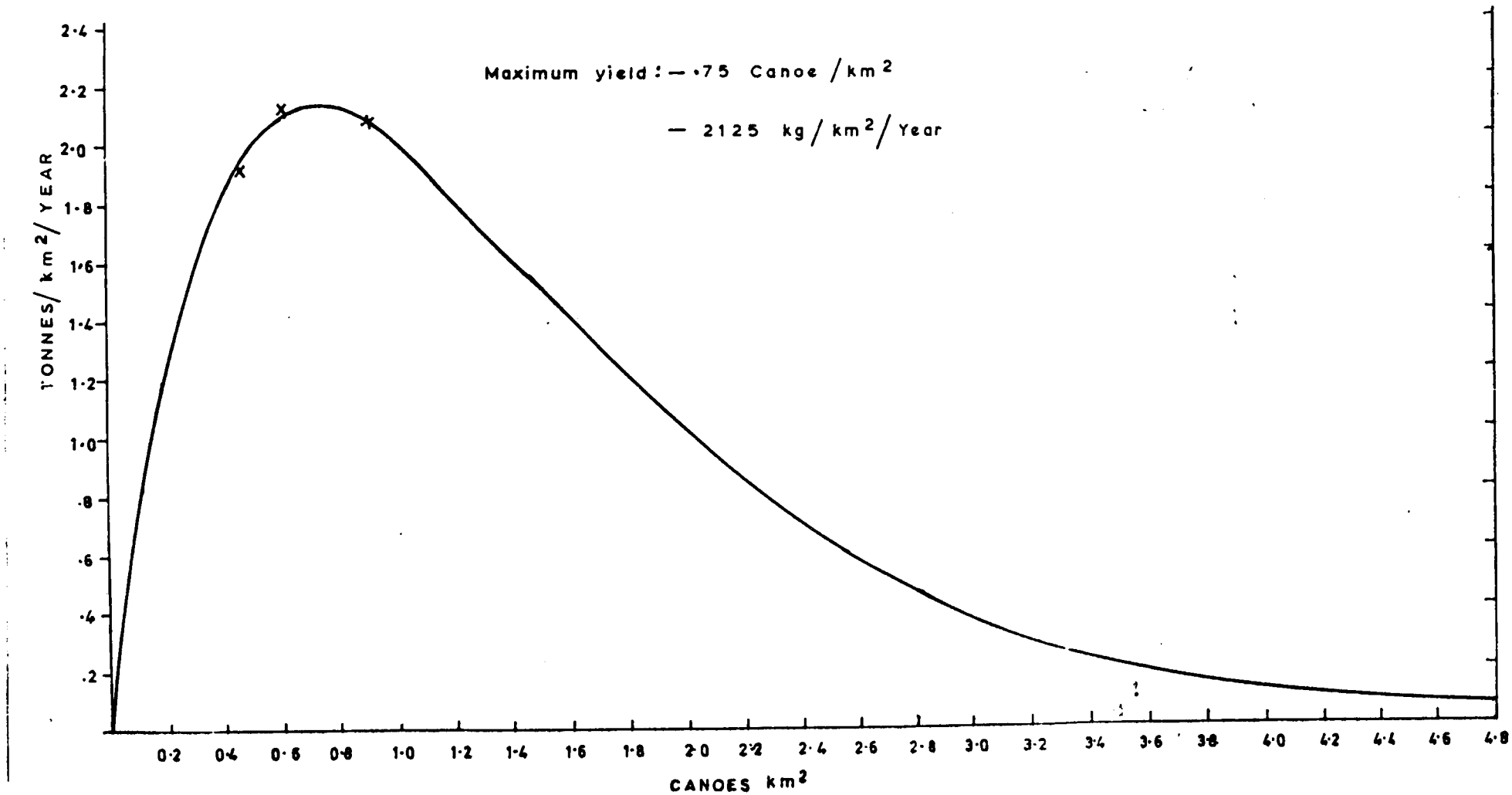


Table 1. Changes in species composition

Year	1968	1973	1981
Quality fish wt.(kg.)	2,763	2,192	2,016
%	42	30	29
Commonfish wt.(kg.)	1,523	1,780	1,960
%	23	25	27
Trashfish wt.(kg.)	1,994	2,808	2,897
%	30	39	41

Source: Gov't. Surveys.

TABLE 2. MANAGEMENT RECOMMENDATIONS (JAMAICA).

---

1. GEAR LIMITATIONS
2. FISHING EFFORT REGULATION THROUGH A SYSTEM OF FISH SANCTUARIES AND CLOSED AREAS.
3. RESOURCE ENHANCEMENT (Artificial reefs).
4. CATCH MONITORING OR STATISTICAL SYSTEM.
5. ESTABLISHMENT OF A FISHERIES MANAGEMENT COUNCIL.
6. A FISHERMENS' EDUCATION & PUBLICITY CAMPAIGN.

TABLE 3. MANAGEMENT RESPONSES BY GOVERNMENT.

1. SPINY LOBSTER MINIMUM SIZE AND EGG - CARRYING FEMALE PROTECTION (1976).

2. THREE MONTHS SPINY LOBSTER CLOSE SEASON (1989) .

3. PARTIAL REDUCTION IN SUBSIDIES TO FISHING.

4. CONTINUED COOPERATION IN MANAGEMENT RESEARCH PROGRAMMES.

5. VERBAL ACCEPTANCE OF THE NEED FOR MANAGEMENT.

TABLE 4. FISHERIES MANAGEMENT POLICY CHANGES NEEDED IN JAMAICA.

---

1. DEVELOPMENT OF THE POLITICAL WILL TO MODIFY THE **STATUS QUO** DESPITE THE PERCEIVED POLITICAL RISK.
2. INTRODUCTION OF A SYSTEM OF REGULAR CATCH MONITORING.
3. PROVISION OF ADEQUATE ENFORCEMENT FUNDING AND PERSONNEL.
4. UPGRADING OF SEVERITY OF PENALTIES AND DISINCENTIVES.
5. GRADUAL PHASING OUT OF SUBSIDIES TO FISHING.
6. ENHANCEMENT OF THE NOW-ESTABLISHED LINKS BETWEEN THE SYSTEM OF MARINE PARKS AND PROTECTED AREAS.
7. STREAMLINING OF BUREAUCRATIC PROCEDURES RELATING TO MANAGEMENT REGULATIONS.

