

## Boats for Coastal Fisheries

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### ABSTRACT

In order to be successful in coastal fisheries a fisherman must be able to land a profitable catch on any given day of the year. This means his boat must be able to reach the fishery and have the means to land the catch.

This paper will define a typical multi-purpose boat for coastal fisheries. The definition will include different fishing methods and gear, boat size, layout and speed. The need for versatility and the ease of versatility will be stressed, since both are critical elements in a successful multi-purpose boat.

### BOATS FOR COASTAL FISHERIES

One of the most common mistakes made by fishermen, and even by fishing companies and governments, is to design and construct a fishing vessel unsuited for the local fisheries and/or for the local fishermen. There is little sense in building a large, offshore type vessel capable of catching and holding tons of fish using technically sophisticated methods if your local fisherman has been historically fishing with a hand line from an open skiff.

In this paper, I will attempt to explain the factors affecting the design and construction of a boat fishing for the coastal zone. For those of you who have access to the proceedings from last year's conference, I hope you will refer to the paper I presented then on the design and construction of multi-purpose boats for coastal and offshore fishing.

Essentially, before one can design, build and successfully operate a coastal fishing vessel, several key factors must be considered:

- I. Species available for commercial harvest.
- II. Methods to catch these species.
- III. Expertise of the local fishermen.
- IV. Local maintenance and repair facilities

### SPECIES AVAILABLE FOR COMMERCIAL HARVEST

In most areas of the Caribbean there are many species accessible to the local fisherman. Each species must be examined to determine its potential yield which will in turn determine the impact that species will have on the design of the boat. Although it is always unwise to build a single purpose fishing vessel, the design of a fishing vessel must be biased to catching the species that consistently produce the most profit.

The more versatile a fishing boat is, the more likely it is to produce a profit. In this case, profit directly translates into fishing time and the amount of catch landed within that time. Therefore, consideration must be given to those other less important species that could be caught when the main fishery is unreachable or unprofitable.

In some instances a fisherman might have to fish for several different species using different fishing gear all in the same trip. Thus, the vessel must be designed to perform efficiently with a minimum of expense to the fisherman. Examples of this will be provided later.

#### METHODS TO CATCH TARGET SPECIES

After it has been determined which species are available in commercially profitable quantities, the gear used to catch these species can be decided. Often times it is possible to catch different species with different gear handled by a common power source or winch. This is a very important factor since it affects the size of the vessel needed and its ease of operation and maintenance.

An example would be that pelagic fishes may be caught in nets or by long line methods and bottom fish may be caught by long lines and fish traps. Therefore, a single winch can be employed to handle both types of long lines and also be able to haul traps and nets with its gypsy head. A common hydraulic pump can power this winch and a power net roller and a series of bottom fishing reels. Thus, with these changes, this simple multi-purpose fishing vessel can be designed.

Each of the methods used should be improvements of the methods historically employed by local fishermen. This is an important factor as will now be explained.

#### EXPERTISE OF LOCAL FISHERMEN

It is extremely important to build on the expertise of the local fishermen. The experiences of men who have probably spent most of their lives fishing in the coastal zone and should be capitalized on by using more efficient means of finding and catching fish. If, for example, a group of fishermen have always used a manual method of catching bottom fish, then they could greatly increase their efficiency by using a mechanical method. With the addition of a recording echo sounder they would not "wet-a-line" until they knew they were "on" fish. Mr. Bob Rich discusses "Electronics for Caribbean Fisheries" in his paper in this session.

Modern versions of tried and true techniques will produce the best results. By increasing efficiency through the use of well designed boats, mechanical fishing gear, and fish finding electronics, a fishermen can produce more product using the same basic skills he has honed through years of fishing.

## LOCAL MAINTENANCE AND REPAIR FACILITIES

Boats built for coastal fishing must be maintained and repaired by local boatyards and repair facilities. The ability of these facilities must be considered when designing and equipping such boats.

Generally, it is good practice to keep all construction and systems as simple as possible. Molded fiberglass construction is relatively maintenance free and easily repaired when damaged. Hydraulic systems are extremely reliable, and require little maintenance and can be constructed with common components.

It is possible to build a truly modern multi-purpose coastal fishing vessel that can be easily maintained and repaired. Care must be taken to use common components that can be easily replaced and to design simple systems that can be easily followed and understood by both the fishermen and the mechanic. All items requiring periodic maintenance should be readily accessible as should all fuel, hydraulic, and steering systems. Engine selection should be based on reliability and the local availability of parts and service.

### CHARACTERISTICS OF A WELL-DESIGNED COASTAL FISHING VESSEL

Size.--The size and speed of a vessel have the largest impact on its cost and ability to reach the fishing grounds. If the fishery one pursues is close to shore or in shallow waters, then these parameters will shape the draft of a boat. If large quantities of fish will be landed on deck in a short period of time, this will affect the amount of working deck area and fish hold capacity. Many vessels have been lost by ignoring these seemingly obvious points. Many more vessels are unable to fully capitalize on a local fishery because of the limitations imposed by the design of their vessel.

Normally, boats fishing in the coastal zone should have a maximum draught of four feet and be no more than 45 feet in length. This will allow them to fish in shallow areas inaccessible to larger craft but still be manageable by 3 to 4 men.

Speed and Range.--Going back to the definition of profitable fishing the speed of a vessel directly affects the amount of time spent fishing versus the amount of time spent running to and from port. If a local fishery is close to the home port, then it is doubtful that more speed will produce more catch. However, if a fishery covers a larger area or changes with the season, then more speed will normally translate into more catch. Since speed costs money, both in capital investment and operating expenses, the need for more speed should be carefully examined. It should be remembered that the throttle can always be pulled back to go slower, but can not always be pushed forward to go faster. A larger engine than might normally be needed would allow a fishermen the ability to increase his speed only when needed.

The range of a vessel is usually determined by how far a fishermen must travel to reach the fishery. Generally, coastal fishing vessels do not have long range capabilities since it is not in keeping with the size of the vessel nor the budget of the fishermen. However, the vessel should be able to carry enough fuel to return to port with a minimum 10% reserve.

Deck Plan.--Since the deck area is where the money is made, it deserves special consideration. The location of various pieces of fishing gear is critical to efficient and safe operation. A properly designed working deck will allow the vessel or equipment operator a clear working view of the operations. Consideration should be given not only to the handling of the fishing gear (such as traps, nets and long lines) but also to the catch that it lands on deck. The catch should be immediately put into a holding area or kill box to reduce loss or damage to the product. The depth of the working deck or bulwark height becomes more important as the vessel size decreases. A fisherman cannot work efficiently if he spends half of his time in preventing himself from falling overboard.

Proper drainage is a must since an excessive amount of sea water on deck poses stability problems that have sunk many vessels. Truly watertight hatches should be employed for access through the weather deck to prevent unnoticed seepage of water into the hull. Also all corners and edges should be faired to protect the fishermen from harm while working in rough seas.

Hull Form.--The underwater shape of a hull effects much of a vessel's motion at sea. It also effects its load carrying ability and speed. The typical semi-displacement hull provides the best compromise between full planing, hard chine hull form and full displacement hull forms. It performs equally as well at displacement speed as it does at modest planing speeds. It normally carries a load extremely well and has better overall stability than hard chine hulls.

Historically, hull forms have evolved in response to local fishing conditions. Special attention should be paid to local fishing craft when designing a new vessel since many of their finer features can and should be incorporated into a new design if the vessel is to be used in a specific area.

In summation, a few key points should be underscored. Due to the increasing cost of building and operating a fishing vessel, it demands that you invest your time in planning and research before you invest your money. A properly designed and built fishing vessel will be able to work in a multitude of coastal fisheries by expanding on a local fisherman's knowledge and expertise and by making his effort more efficient. Modern materials will ease the burden of maintenance and electronic navigation and fish finding equipment will eliminate much of the guess work.