

Brush Shelter: A Recently Introduced Fishing Method in the Kaptai Reservoir Fisheries in Bangladesh

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Abstract

Since the early 1990s, the brush shelter fish aggregation device (FAD), an unusual fishing method used in Bangladesh, has become popular with the fishers of Kaptai Lake. A shelter commonly covers an area between 0.02 and 0.12 ha and is usually installed along the edge of a channel (arm of lake) with a reasonable water depth. Brushes are square/rectangular/round surrounded with bamboo or wooden frames constructed with tree branches. To attract fish, water hyacinth is placed over the surface. The difference between this fishing practice and similar ones used elsewhere in Bangladesh is that it makes use of locally available feed ingredients (rice bran, wheat bran, mustard oil cake, fermented rice, etc.). Spices and fish scents are also used two to three days prior to harvest. It is estimated that about 1 000 brush shelters are in operation around the reservoir and are fished twice a year. The quantity of fish caught in each brush varies directly with the size and location of the brush and feed quality. A total of 483 t of fish of different species is harvested annually, accounting for about 8% of the total catch from the reservoir. Unplanned and unregulated use of this type of fishing poses a serious threat both to the natural stocks and to the effectiveness of stock enhancement as mostly small fish are harvested.

Introduction

In Bangladesh, inland open-water fishery resources play a significant role in the economy, culture, tradition and food habits of the people. Inland capture fisheries are considered to be potentially one of the richest fishery resources. They currently contribute about 52.2% of the total fish production in the country. Kaptai Lake, situated in the southeastern part of Bangladesh, with an average surface area of 58 300 ha (68 800 ha when full) and water reserve of $525 \times 10^6 \text{ m}^3$, is the largest in South Asia (Fernando 1980). Like most reser-

voirs in South Asia, it was created (in 1961) primarily for hydroelectric power generation, with fisheries, navigation, flood control and irrigation as secondary uses. The maximum and mean depth of the reservoir are 35 and 9 m, respectively, with a mean annual water level fluctuation of 8.14 m. The shoreline of the reservoir is rocky and strewn with remnants of submerged wooden logs and rocks that hinder fishing activities. In spite of this, the reservoir contributes substantially to national fish production.

The fishing gears used in the Kaptai reservoir are mainly tradi-

tional. The brush shelter (a fish aggregation device) has become popular with the fishers of Kaptai Lake since the early 1990s. This paper describes the brush shelters in Kaptai Lake based on a field survey of four major fishing grounds undertaken in January-December 1997.

Materials and Methods

The survey covered 100 brush shelters or about 10% of the estimated brushes employed in these fishing grounds. Random sampling was done irrespective of brush size

(area) and location. Information on catch and species composition was obtained through observations by the authors and related information was collected through a structured questionnaire.

Observations and Data

Brush Shelter

This is a very simple method employed to trap fish using branches of bushy trees and is locally called *juk* fishing. The term *juk* also varies regionally with a number of synonyms such as *jhug*, *katta* and *jhata* (Wahab and Kibria 1994). A range of materials including bamboo, coconut logs, brushes and aquatic weeds are used for the construction of the shelter. About 1000 brush shelters are operated around the reservoir and each brush is fished out at least twice a year. The fishery lasts for six to seven months (November to May) and the peak period of fishing is from February to May. FAP-17 (1994) noted that brush shelters are fished out three to four times over a period of five to seven months in the rivers and canals of Bangladesh. Fishers in Kaptai Lake prefer shallow creeks with a clean bottom. This fishing method is dependent on the water level. The water level of Kaptai Lake fluctuates because of hydropower generation. The brush shelter fishery in Kaptai reservoir differs from other such operations in inland waters in that it uses fish luring devices with locally available ingredients.

The brush shelter usually covers an area ranging between 0.02 and 0.12 ha. It is installed along the edge of a channel of reasonable water depth. The shelter is a square, rectangular or rounded enclosure surrounded by bamboo or wooden frames within which branches of bushy trees like blackberry or java plum (*Syzygium cumini*), wax jambu (*Eugenia alba*), mango (*Mangifera indica*), Hizole



Brush shelter ready for fishing operation at Kaptai Lake reservoir.

(*Barringtonia acutangula*) with a surface raft or covering of water hyacinth (*Eichhornia crassipes*). A number of bamboo poles are fixed around the brush to retain the structure and define the shelter area. A frame made of bamboo splits is also tied horizontally to the bamboo poles surrounding the brush shelter to keep the water hyacinth intact. Attractants/feeds like wheat bran, rice bran, mustard oil cake and fermented rice (residue from locally made wine) are administered periodically. Tree branches of spices like fenugreek (*Trigonella foenum graecum*) and boss/justi modu or cultivated licorice

(*Glycyrrhiza glabra*) and akangi (*Acorus calamus*), which provide scent to attract fish, are used two to three days before harvesting.

Fishing Operations

The harvesting of fish from brush shelters is complicated. First, fishers encircle the brush shelter with a net keeping a narrow passage open between the net and the shoreline to trap additional fish in the shelter. Then attractants are used to lure the fish into the encircled area. The passage is usually kept open for six to seven days. The fishers close the passage once they



Brush shelter during fish harvest at Kaptai Lake reservoir.

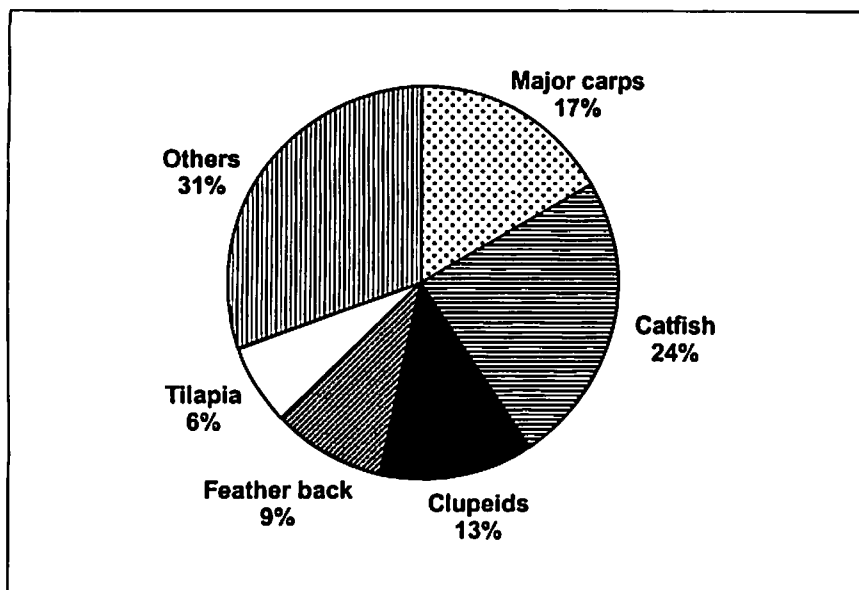


Fig. 1. Percentage composition of major categories of fish caught during the study period.

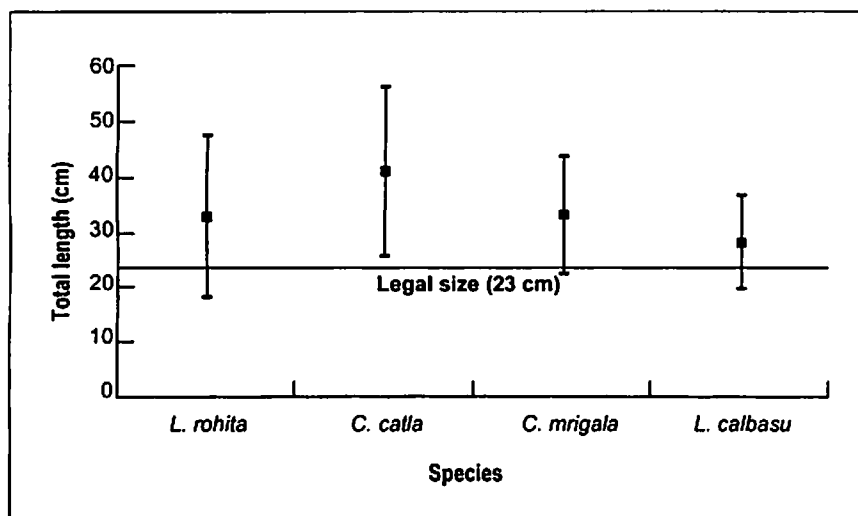


Fig. 2. Length range (cm) and standard deviation (SD) of major carps caught in brush shelters.

judge that there is a good quantity of fish in the trap. The encircled area is then divided into two parts, mainly to clear the brushes from one half to the other side in order to facilitate complete harvesting. The harvesting starts with a cast net of large mesh size (7.5-9.5 cm) to catch the large fish. Once the large fish have been caught, the mesh size of the net is slowly reduced in order to catch the remaining small fish for a total harvest. After seven days of fish harvesting, the brush shelter is rebuilt for the next operation. A brush shelter is usually owned by one or two fishers. An

additional three to four people are hired during each harvesting operation. Very often, a hired fishing team is used to catch the fish. In this case the brush owner keeps 50% of the catch and the fishing team gets the rest.

Catch Composition and Yield

The fishers surveyed achieved a mean harvest of 242 kg/brush at a time, with major carps comprising 17% of the catch (Fig. 1). Among the major carps, *Labeo rohita* contributed about 9% fol-

lowed by *Cirrhinus mrigala* and *Labeo calbasu* at around 3% each. Wahab and Kibria (1994) reported that catches from brush shelters in inland waters of Bangladesh generally range from 100 to 1000 kg. The quantity of fish caught in each brush varies greatly according to the size of the brush, location and the feeding quality. FAP-17 (1994) emphasized two prerequisites in site selection for brush fishery: shallow water depth and clean bottom.

According to the Fish Act of Bangladesh, catching of major carps of less than 23 cm in length is illegal. Of the major carps harvested, almost 23% were less than 23 cm in length (Fig. 2). The size of *L. rohita* caught from the brush shelters was in the range of 18.0-68.0 cm while in the case of *C. mrigala* it was 18.0-55.0 cm, *Labeo calbasu* 18.0-48.0 cm and *C. catla* 21.0-75.0 cm. The average weight ranged between 350 g and 1670 g. A total of 483 t fish of different species and sizes is being harvested each year, accounting for about 8% of the total catch from the reservoir. Major carps contribute 81 t to the catch from brushes. Fishers indicated that this type of fishing is on the increase throughout the shallow areas of the reservoir.

Socioeconomic Aspects

Brush fishing is mainly practiced by the fishing community residing along the lakeshore. Some fishers consider this an additional source of income. As this fishing technique is quite new, there is no license fee or credit system. Fishers complain that sometimes they have to pay money to the local royalty collector before harvesting fish from the shelter. Fish traders have also been investing in this fishing practice in recent years.

The wives and children of the fishers usually administer feed in the shelter. There is no specific routine followed for feeding. The average value of fish per brush per harvest

amounts to Tk7900*. Almost all fishers depend on hired fishing teams as during harvest they do not possess the necessary nets, boats and other equipment. Installation of brushes is done by the family. Most of the fishing households surveyed reported that they need credit. About 82% of the brush fishers surveyed are also involved in fishing with other gears.

Policy Implications

In Kaptai Lake, brush shelter fishers comprise only a minority of the total fishing community. The other fishers say that brush shelters are detrimental to the overall fishery in the lake as it involves complete harvesting of all the brood fish with their progeny. To replenish the stock and to forestall possible breeding failures, fingerlings of major carps are being stocked in the Lake since the advent of this fishery. Currently an average of about

35 t of fingerlings are stocked in this reservoir each year. These fingerlings take shelter in the brushes and are caught before they attain the size for legal capture or mature. It is necessary to have a detailed assessment of the present status and predict the future trend of this fishery. Without proper management, the sustainability of natural stocks and the effectiveness of the stock enhancement programs undertaken by the government could be undermined. Fishers should be discouraged from using brush shelters. Since this fishing method is of recent origin, fishing regulations need to be amended and awareness of the harmful effects of the technique be raised. The control of water hyacinth would indirectly hamper the installation of brush piles.

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*US\$1 = Tk44.10 in 1997.

