MARINE FISHERIES INFORMATION SERVICE

TECHNICAL AND
EXTENSION SERIES

No.49
April, May 1983

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
COCHIN, INDIA

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

EXPLOITATION OF CLAM SHELL DEPOSITS IN THE KUNDAPUR ESTUARY*

The Kundapur estuary is the largest estuarine system in the Dakshina Kannada district of Karnataka with a water spread of about 26 sq. km, situated about 100 km north of Mangalore, and is important for clam landings. Till recently the sub-soil shell deposits in the estuary were exploited on a very limited scale due to poor demand. The establishment of a polyfibre industry in Harihara has opened up a new avenue for lime shell utilisation and, consequently, lime shell production has attracted the attention of poor people. The introduction of a simple but effective device for collection of clam shells in 1975 proved to be a turning point in the exploitation of the resource. The shell deposits are comprised of *Meretrix casta* - 40%, *Meretrix meretrix* -25%, *Paphia malabarica* -25% and others (*Anadara Cerethedia* and oysters) - 10%.

Description of shell dredge

The dredge used for the collection of shell deposits is locally called "machine" (Fig.1). It consists of a semicircular iron ring, to the free ends of which is fitted a slightly curved iron base plate of about 42 cm length, having 19–20 spikes pointing downwards. The height of the plate with spikes is 4.5 cm. To the middle of this spiked plate, an iron piece (about 13 cm length) is rivetted to which a wooden piece of about 60–65 cm is attached. A bamboo pole, 6.5 m long, is tied to the wooden piece. An iron chain of about 3 m length is rivetted to the free ends of the ring. To the middle of this chain a nylon rope of about 10–11 m is tied. The arrangement facilitates dragging of the dredge over a pulley attached to the boat. A net is attached to the device to hold the shells being dredged. To the cod end of the net a 2m rope is tied on the inside, which could be pulled up and down for cleaning the shells.

Operation of dredge

A pair of boats is employed for the operation of the dredge. Each boat is manned by two persons. Usually they go out for collection early in the morning and return by mid-day. Initially the estuarine bed is sounded to detect the shell deposits. The shell collectors thrust a bamboo pole into the bed till the shell layer is reached and drive it deeper to know the thickness of the bed which is measured by the sound made by the thrust of the pole through the shells. The prospecting is usually not carried out daily as one site may yield shells for a few days.

Each boat is tied to 2 to 3 casuarina poles fixed in the river bed. The second (rear) boat is positioned parallel in line with the first boat in such a way as to leave a gap of 1 m in between, also lying 1 m to the left of the first boat. The dredge is driven well into the bed from the first boat and the rope is pulled up over the pulley in the rear boat. A person in the first boat takes charge of the cleaning rope. The dredge is pulled to collect the shells which are cleaned by lifting the cod end of the net. Then the shells are emptied into the first boat. Each operation normally takes 2–3 minutes. In a single operation about 10 to 20 kg of shells are hauled up depending upon the thickness of the shell layer. The boats used for collection of shells are usually of 1 tonne capacity. Each site may yield shells for one or two weeks before it gets exhausted. The site again becomes productive after a couple of months or more, with the filling of shells due to movement of the loosened layer of shells around it.

Shell Production

A unit of a pair of boats collects about two tonnes of shells a day. There are about 85 units operating in Kundapur estuary. During the south-west monsoon season the number of units may be as high as 125, as the fishermen gets a gainful occupation during the off season. The total production of shells varies from 150 to 175 tonnes per day. Boats of 10 tonnes capacity are used for transporting shells from the collection sites to the selling point. Mechanised shell washers with running water are used for further cleaning shells. In this process small broken pieces of shells, sand and mud constituting about 10–15% are removed. A co-operative organisation "Swawalambi Sangh" of Kundapur, purchases all the lime shells directly, eliminating the middlemen, and thus protects the economic interests of shell collectors. The shells are sold by the Sangh at Rs 85–100/tonne at Kundapur.

The estimated production of lime shells in Kundapur estuary during 1975 to 1982 (July-June) is given below:

Year	Production (tonnes)
1975-76	13,500
1976-77	21,540
1977-78	22,000

*Prepared by G. Syda Rao

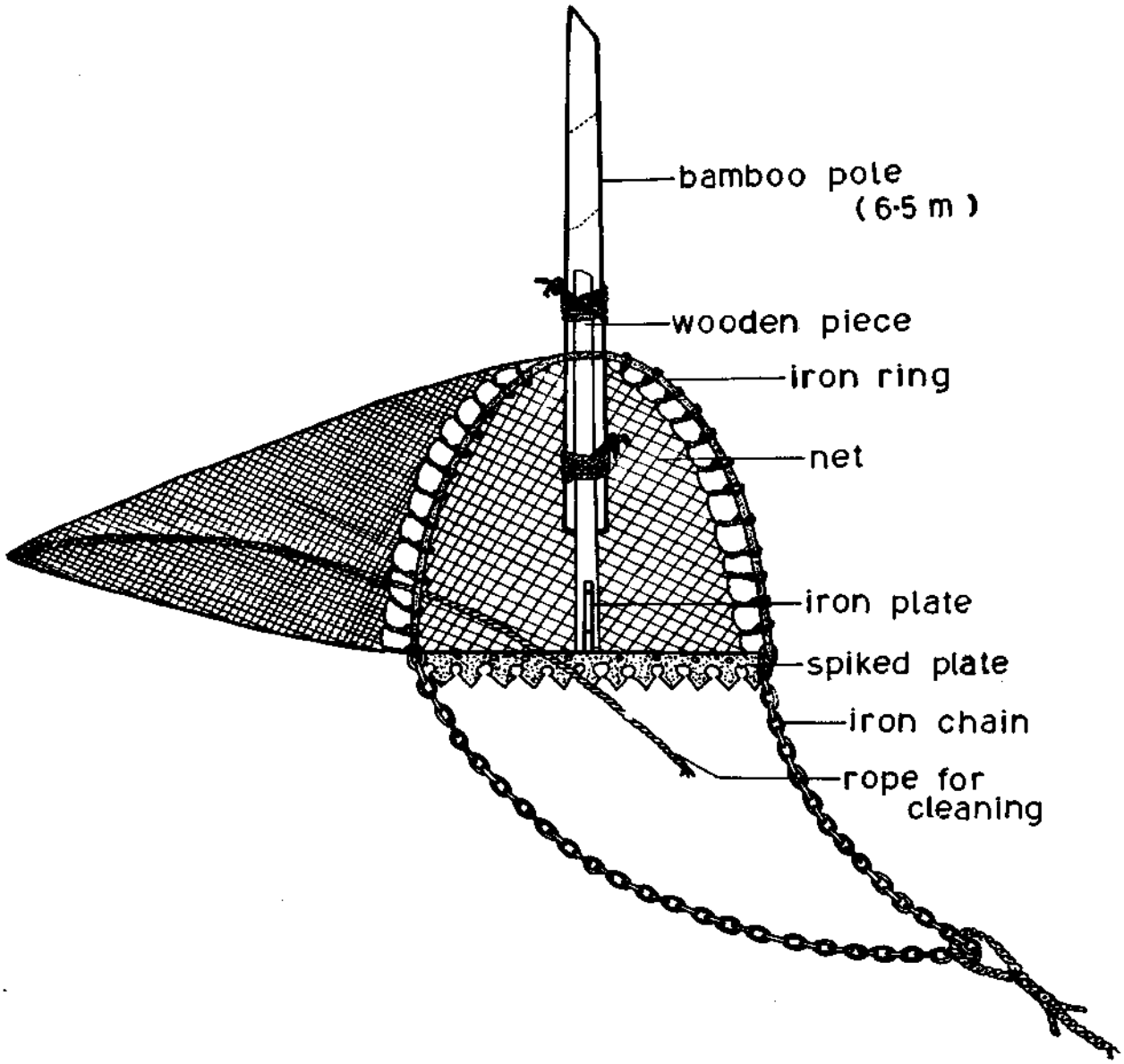

Fig.1. Construction details of shell dredge.

1978-79	19,680
1979-80	22,470
1980-81	29,540
1981-82	14,325
1982-83 (Upto Dec. '82)	6,000

Utilisation

As stated earlier the major user of these shells is the Harihara polyfibres. The shells form an important component of 'Chemical recovery process' in most of the pulp (paper and rayon) industries. The shell lime is also used for treatment of effluents, to neutralise soils of coffee and tea plantations, and as a pesticide by mixing with copper sulphate. The finer bits of shells are mixed in the poultry feed.

Present status of shell collection

About 450 people are employed practically throughout the year. At present the shell collection is concentrated around. 'Uppena Kuduru' is let in the estuary. This estuarine area is about 138 ha and was leased out for 20 years, by the Department of Mines and Geology, Government of Karnataka to the first five

Fig.1 General view of Kundapur estuary, showing a number of units engaged in shell collection

Fig.2. Dredge, locally called "machine", hauled with shells.

Fig.3. Close-up view of the pulley attached to the rear boat to pull up the dredge.

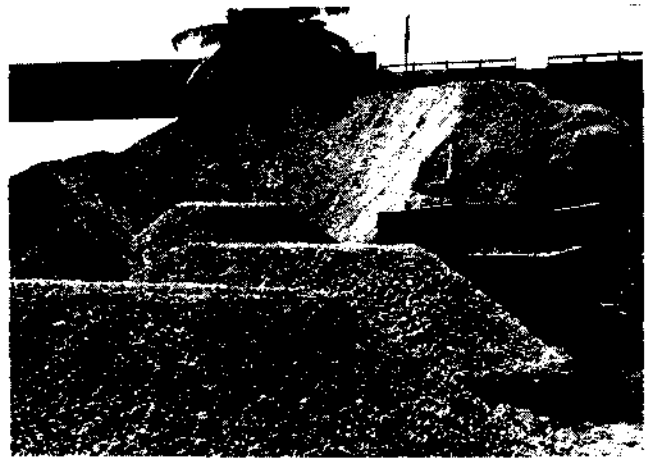

Fig.4. A view of heaps of cleaned shells near a lime factory at Kundapur.

years and Rs.36, during the rest of the 15 years. Further, they have to pay Rs.4/tonne of exploited shells as 'royalty'. In addition to Kundapur estuary, about 247 ha in the Byndoor estuary and 293 ha in the Udyavara estuary have already been leased out for the exploitation of shell deposits. The deposits are noticed 1 to 1.5 m below the soil and the height of water column over the bed varies from 1.5 to 3 m.

General remarks

Very rarely a few live clams are found in the dredge collections at present, indicating absence of clam beds. But this area was known to yield good quantities of live clams, particularly *Paphia malabarica*, till 1978-79. Continuous dredging might have disturbed the substratusm and prevented the settlement of clams. Extensive operation of dredge has adversely affected one of the clam beds in the sea between Gangoli and Uppena Kuduru. Regulatory measures are necessary for proper management of clam resource in these estuaries keeping the long-term benefits in view.

The author is thankful to Dr.E.G. Silas, Director, C.M.F.R.I for encouragement and to Dr. K. Alagarswami, Head, MFD, for suggesting the study, guidance and critically going through the manuscript. Also thanks are due to Shri K.Devadas Pai, Swawalambi Sangh, Kundapur and Department of Mines and Geology, Mangalore, for their help.