# CHAPTER 1

## A GENERAL ACCOUNT OF THE BIOLOGY OF HILSA ILISHA (HAM) AND HILSA TOLI (CUV. & VAL.)

The migration of the Indian shad, H. ilisha, up the major rivers is well known. Day (1878) observed that "the main body of these fish swarm up all the larger rivers of India and Burma with commencement of monsoon". Moses (1940, '42) and Pillay (1948) referred Hilsa fisheries in and around the Gulf of Cambay. The occurrence of Hilsa on the Malabar coast was recorded by Chacko and Ganapati (1949).

The migration is for spawning only (Kulkarni, 1950; Pillay, 1958). That the growth rings on the scales cannot be used for age determination was established by Jones and Menon (1951) and Pillay (1958). No death after spawning has been reported by any one of the various workers. During the last six years we could catch spent fishes returing to sea. Probably Hilsa ilisha spawns more than once (Kulkarni, 1951).

It is well known that H. ilisha abounds in the river Indus but the next maximum concentration is found in the Narbada river on the west coast of India which provides the main breeding ground for the fish. Several workers have reported fishing in and around Gulf of Cambay and in river Narbada (Moses, 1940, '42; Pillay, 1948; Kulkarni, 1950, '51). The river Narbada traverses a length of 800 miles and finally empties into Gulf of Cambay near Broach (Map.II). Major rivers

like Mahi, Narbada and Tapti open into the Gulf of Cambay turning the whole area into a vast estuary. At the time of maximum floods the discharge of water is two and a half million c. ft. per second. Width is one mile near Broach, and about 13 miles near the mouth. Kulkarni (1951) gave a detailed account of Hilsa fishery and migration in the river Narbada. The breeding grounds are located 40-45 miles upstream along the course of river. Migration limit is about 100 miles, the steep course of the river being the limiting factor.

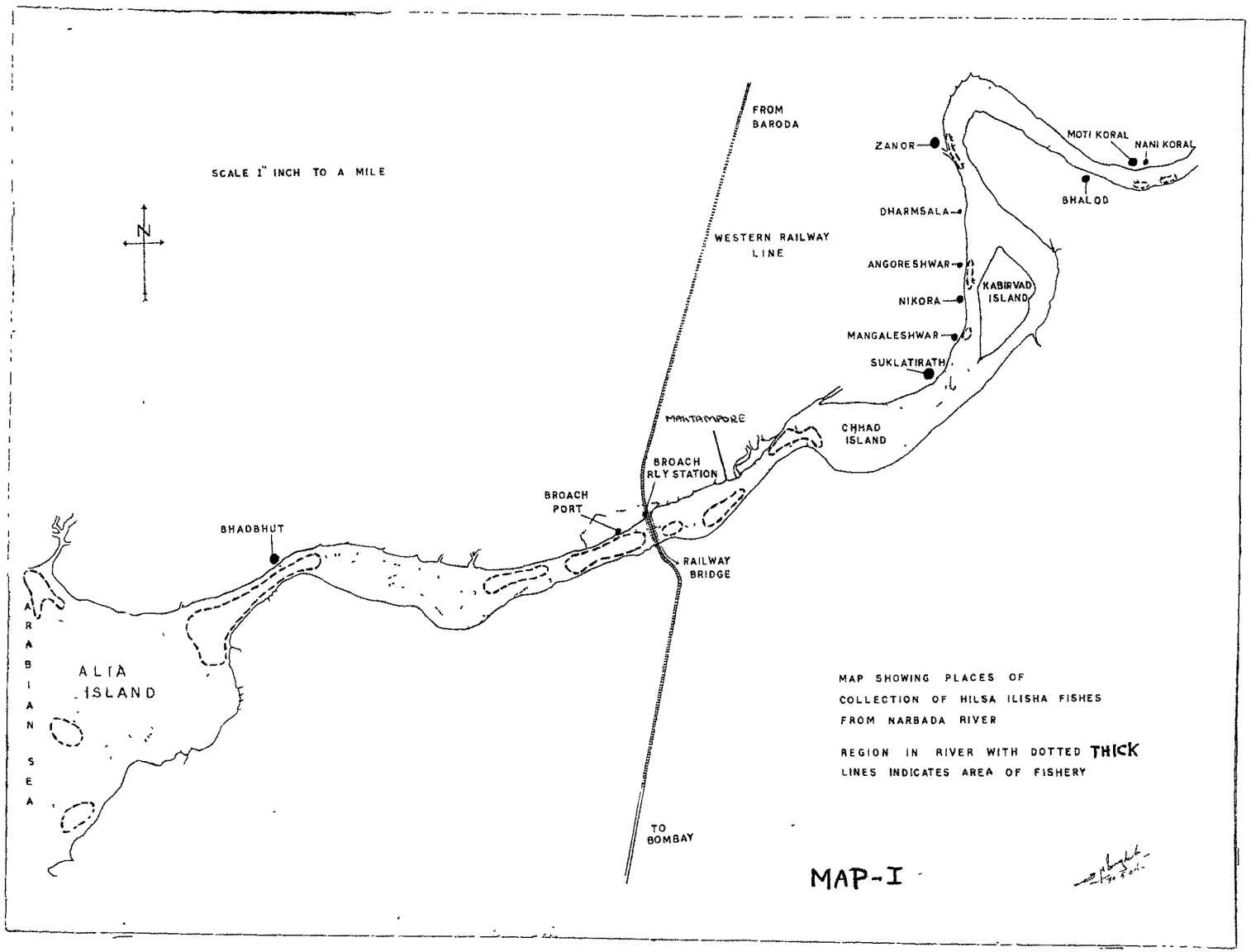
There are two distinct runs of migration of H. ilisha (Ham.) in the river Narbada. First run is in monsoon, from June to September and the other in March to April. Lunar periodicity of the migration of H. ilisha in shoals has been reported by Kulkarni (1951). The maximum number of mature fish were collected on the full moon and no moon days of the month.

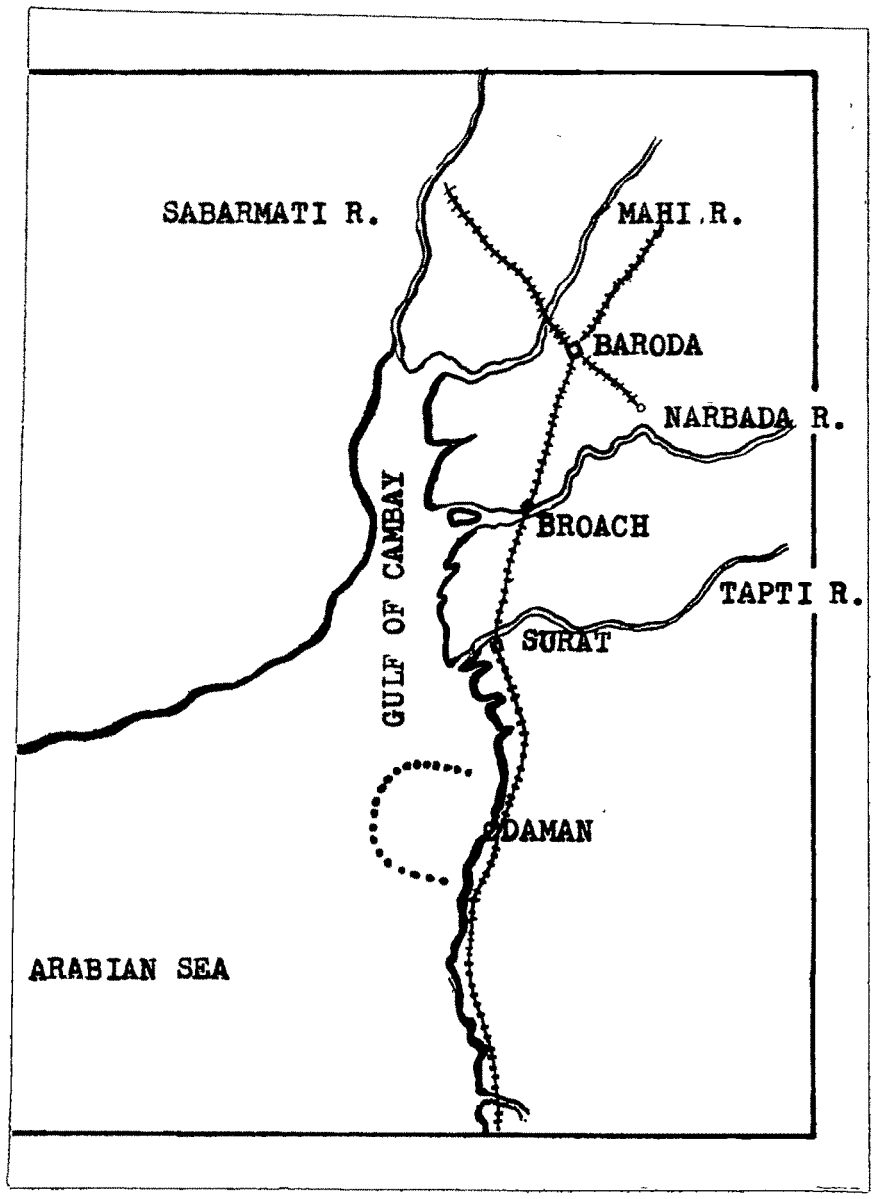
Kulkarni (1951) has given the characters for identification of H. ilisha (Ham.) and H. toli (Cuv. & Val.). The same were followed in the identification of the fish. Gonad stages were classified according to Bower (1954). Mature (stage V and VI) and spent (stage VII) H. ilisha were collected from Bhadbhoot, Maktampore and Zanor (Map. 1)during the years 1963, 1964 and 1965. The fishes are caught by fishermen using gillnets operated from small flat bottomed boats. The average weight of a migrating female was found to be 836 g.(660 g.- 1070g.) and of male 567 g.(360g- 640g). The fingerlings of H. ilisha, resulting from the first spawning run, return to sea in the months

of December-January. These are caught by fishermen in stake-bagnet. Live fingerlings from such bagnets were collected near Maktampore. Immature H. ilisha from sea were collected off Daman on the west coast of India- from the area shown in map II.

All stages of H. toli (Cuv. &Val.), one of the important food fishes of India, is captured throughout the year in large numbers from sea. These fishes were also collected alongwith H. ilisha off Daman. (Map-II) Immature, mature and spent H. toli and immature H. ilisha were captured from sea during October-April 1963, 1964 and 1965.

During the highest high tide day of the year in monsoon, the water around Bhadbhoot is completely fresh water. It was possible to collect drifted H. toli from these waters. These fishes must have beem drifted due to the force of tidal currents as it is never caught near Bhadbhoot in the river Narbada except on the highest high tide day of the year. On this day it is captured in fairly large numbers. Pillay (1953) also reported dispersion of H. toli in the river Hoogly, 70-80 miles upstream from the mouth of the river, due to tidal current.


SCALE 1" INCH TO A MILE
N
FROM BARODA
WESTERN RAILWAY LINE
ZANOR
MOTI KORAL
NANI KORAL
BHALOD
DHARMSALA
ANGORESHWAR
KABIRVAD ISLAND
NIKORA
MANGALESHWAR
SUKLATIRATH
MANTAMPORE
CHHAD ISLAND
BROACH RLY STATION
BROACH PORT
BHADBHUT
RAILWAY BRIDGE
ARABIAN SEA
ALIA ISLAND
TO BOMBAY
MAP SHOWING PLACES OF COLLECTION OF HILSA ILISHA FISHES FROM NARBADA RIVER
REGION IN RIVER WITH DOTTED THICK LINES INDICATES AREA OF FISHERY
MAP-I




Map II

GULPH OF CAMBAY AREA. Dotted line shows the area of fishing.