

# Valuation of Fishing Tools and Social State of Hilsa (*Tenualosa ilisha*) Fishers of the Estuary of Shatt al-Arab River, Basrah, Iraq



Laith A. Jawad and Audai M. Qasim

**Abstract** In this chapter a study was performed to evaluate the type of living of the Hilsa fishers at the estuary of the Shatt al-Arab River, Basrah, Iraq. Information was obtained by a questionnaire system. The age, education, family size, housing condition, etc. were investigated. Fishers also faced numerous problems such as child education, health facilities, food consumption and pasting of savings during low catch season. The results showed that an immediate solution for the problems of the Hilsa fishers in the estuary of Shatt al-Arab River is required in order to upgrade the lifestyle of these groups.

## 1 Introduction

The stream of the Arabs is the English translation of the Arabic name of the river Shatt al-Arab, which formed as a meeting of Tigris and Euphrates Rivers at the southern part of Mesopotamia north Basrah City. Tigris and Euphrates Rivers arise in eastern Turkey, while Euphrates crosses Syria before entering Iraq, Tigris River pass in Iraq directly from Turkey. Shatt al-Arab River has a length of around 200 km, and it flows into the Arabian Gulf. The river is suitable for navigation up as far as Basrah City. This river has only one tributary, the Karun River that links the watercourse from the Iranian side of the river.

The approximate area of Shatt al-Arab estuary is  $(10\text{--}20) \times 10^3 \text{ km}^2$  comprising different types of terrains and habitats (Patiris et al. 2016). Shatt al-Arab is one of the most damaged freshwater environments as it accrues the influence of two main wars and other man-made pollutants of different sorts. Anthropogenic effects on Shatt al-Arab River are still in progress and can be seen today in the form of oil pollution

---

L. A. Jawad (✉)  
Pokeno, Auckland, New Zealand

A. M. Qasim  
Department of Marine Vertebrates, Marine Science Centre, University of Basrah, Basrah, Iraq

caused by production and transportation of oil, urban water usage and power plants (Sheppard et al. 2010).

*Tenuulosa ilisha* known as the Indian shad is an anadromous clupeid fish and considered among the highly imperative fisheries in the estuarine waters and some distance upstream (Sarma 1984; Faruque and Ahsan 2014). This species showed a westward distribution from the Southeast Asia toward the Arabian Gulf area, where ascends to rivers at the north of the Arabian Gulf such as Shatt al-Arab River and other rivers in Iran. Through its distribution, individuals of this species enter the Arabian Gulf area along the Iranian side and continue swimming with the current entering the Sea of Oman and the Arabian Gulf up to Basrah City, south of Iraq, where at this point ascend Shatt al-Arab River aiming to reach the southern marshes of Iraq to lay their eggs (Al-Hassan, 1999). The northern limit of distribution in the freshwater system of Iraq is supposed to be at the southern marshes at City of Basrah, but several reports have shown that the northern extension of the distribution of this species has been stretched to city of Maisan north of Basrah. An old document has shown that individuals of this species have been caught from the Tigris River at Baghdad city, Middle of Iraq (Jawad 2012).

The biology of reproduction of this species showed that *T. ilisha* is a multi-spawner, with extended spawning period that may continue from May to August (Hussain et al. 1991; Faruque and Ahsan 2014). Maturing individuals ascend Shatt al-Arab River with length ranging between 200 mm and 550 mm in total length, while a few immature fish enter the same waterway as small as 220 mm in length (Jabir and Faris 1989).

The fishery season in the Shatt al-Arab estuary is unique in having presence of individuals of *T. ilisha* two times per year, one time when they ascend the river and the second time when the adults return back to the sea (Al-Hassan 1999). Therefore, the fisheries of this species interact very much with the socio-economic of the fishers resided at the estuary of Shatt al-Arab River. Such dependence is also evident in estuaries of other rivers through the geographical distribution of this species (Haque et al. 2017; Faruque and Ahsan 2014). In the socio-economic studies, the circumstances of anglers, it is known that the fishermen are the poorest group of people in the country. The effective application of developmental package is delayed owing to the absence of satisfactory and reliable data on socio-economic condition of the target population (Ellis 2000; Faruque and Ahsan 2014). Unluckily, there has been slight or nearly absent administrative and other organizations' (NGOs) inventiveness in Iraq to accomplish and enhance Hilsa fishermen socio-economic status in this area. Therefore, prohibition periods of catching fishes cannot suggestively subsidize in mounting catch per unit effort. This declining trend of catch per unit effort makes them more susceptible to neediness day by day. Several studies have been conducted on biology (Hussain et al. 1991; Mohamed and Qasim 2014; Almukhtar et al. 2016) of Hilsa fisheries in the estuary of Shatt al-Arab River. But there is no strong thoughtful around the influence of forbidding period on the incomes of Hilsa anglers in these localities. Seeing the overhead mentioned detail, this investigation was planned to review the state of structure, construction materials of gears and craft

and livelihood status of Hilsa fisherman living around the estuary of Shatt al-Arab River, Basrah, south of Iraq.

## **2 Data Collection and Analysis**

A total of 250 fishermen were nominated consistently from the estuary of Shatt al-Arab River. Primary data were obtained centred on questionnaire interview, field survey, focused group discussion and direct observation. Fishing gears, operation time, total number and different necessary information on Hilsa fishing crafts used in the study area were gathered in the relation of the need of the study by direct observation. Secondary data on fishing gears and fishing crafts used for Hilsa fishing and livelihood of fishermen were collected from the media and other social resources, but since *T. ilisha* is usually caught in a single type of fishing gear, the information on this aspect was restricted. The data were edited and coded after their collection. Then the information was shortened and examined thoroughly and noted. All the gathered facts were stored and evaluated by MS Excel and then displayed in textual, tabular and graphical manners to comprehend the present living status of the fishers in the studied area.

## **3 Results Obtained and Discussed**

### ***3.1 Fishing Gears***

The gear used in catching Hilsa fish were mainly monofilament gill net varying in length between 20 and 50 m and width of 2–4 m, with mesh size of 45–105. Different net may be used in catching *T. ilisha* by different fishers.

The common fishing net in the estuary of Shatt al-Arab River is the drift net of 20–50 m. during the fishing season. Generally gill net used having 5 to 14 cm mesh size were used for Hilsa fishing, which is similar to those used in other river's estuary along the geographical distribution of *T. ilisha* (Chantarasri 1994).

### ***3.2 Fishing Crafts***

Fishing crafts are nonspecialized boats, and any boat used for fishing of fish species other than Hilsa is usually used by fishers. There were 75 small motorized fishing boats found during study period. These boats having length ranging between 5.28 and 7.5 m, width 1.30 to 1.45 m and depth 0.50 to 1 m. They have flat bottom and pointed stern and need one to three persons to run. Resilience of this type of boat is



**Fig. 1** Process of catching *Tenulosa ilisha* in the estuary of Shatt al-Arab River, Basrah, Iraq. **(a)** Net laying on the deck of a fishing boat ready to be deployed once the boat reaches the fishing ground; **(b)** the start of deploying the fishing net, with the anterior end attached to pole and black flag; **(c)** fishing net fully deployed in the estuary; **(d)** start of pulling the fishing net

2–5 years. Due to the water movement and depth at the estuary, no small boats were seen in usage by fishers (Figs. 1 and 2).

### 3.3 Socio-economic Conditions of Hilsa Fisherman

For the livelihood characteristics of the fishermen, a thorough investigation was performed on the following variables and given in this following section.

#### 3.3.1 Types of Fisherman

In this examination, two kinds of fishers were found operating in the estuary of Shatt Al-Arab River professional (61%) and occasional (39%). The percentage for the professional fishers is higher than that reported from other areas (Haque et al. 2017).



**Fig. 2** Process of catching *Tenualosa ilisha* in the estuary of Shatt al-Arab River, Basrah, Iraq (Continue). (a) Continuing pulling the net; (b) pulling the start end of the net with a pole; (c) freeing fish from the net; (d) some of the catch of *Tenualosa ilisha*

### 3.3.2 Oldness Ranks of Fishers

Different groups of age groups: less than 20, 21–30, 31–40 and 41–60 and above 60 were obtained for examination for the purpose of age structure. The survey showed that 47% were between the age group of 21–30 and 31–40 years old. This may be owing to the participation of young fishers in fishing occupation in the study areas. The results obtained in the present study are similar to those of Kostori (2012), who stated that mainstream (36%) of fishers of the Chalan Beel, Bangladesh, was included within the age group of 20 to 30 years group.

Hilsa fishers in this investigation were assembled into four classes on the ground of the grade of learning. Out of 250 fishermen of the estuary of Shatt al-Arab River surveyed, an average 10.79% had no education (illiterate), 24.43% can sign only, 10.86% had primary level and 53.92% had secondary level of education or higher. This finding was not similar to the findings of Ali et al. (2005; Faruque and Ahsan 2014). They stated that the main sector of the fishers was anglers (who practiced fishing throughout a part of the year as uneducated, and these values were 88% and 68% respectively, indicating they were not able to sing and count). But this examination revealed that utmost of the Hilsa fishers of the selected areas were able to sign; this is might be personal initiative for the education by the young fishermen.

### 3.3.3 Fishing Experience

To examine the stability of fishing occupation under different groupings, fishing knowledge was allocated into three groups like 0–10 years, 11–20 years and > 20. In the estuary of Shatt al-Arab River, 65.17% boat owner, 34.83% labour fishermen and 60% of the fishers were found with fishing experiences of 0–10 years. That means young generations are involved in fishing activities nowadays. The present result is not similar to that of Haque et al. (2017), Islam et al. (2013), and Faruque and Ahsan (2014), who found fishing knowledges of fishermen ranging between 2 and 32 years, which is higher to the present study.

### 3.3.4 Family Size

Number of individuals in each family is vital socio-economic livelihood as it disturbs the revenue, food eating and socio-economic health of the households. This number and its configuration were linked to occupation and pay and were expected to have a significant impact on fishing activities. Information on family associates of Hilsa fishermen in the study area revealed that 56.14 to 79.26% of the fishers had three to six family members, 20.74 to 34.33% had one to four family affiliates and 3.17 to 15.29% had eight to ten family associates which also agreed well with the results of Kabir et al. (2012) and Hossain et al. (2009) and Ali et al. (2005).

### 3.3.5 Earners and Dependents

It was noted during this survey that only male fishermen earns money and the female helps in making net and look after the children and keeping house. In some families, children (below 15 years) also earn money. The reliance ratio was calculated by dividing the total numbers of reliant on affiliates of the family by the total number of getting salary associates of each family. Highest earner and dependent ratio that was found among the fishers' families was 1:2.56.

### 3.3.6 Accommodation Status

Most of the fisher's houses in the studied area were built with cement blocks and fall in one story with no outside area. Number of rooms varies between 2 and 4, with the area of each room not exceeding 7 m<sup>2</sup>. Most the houses were not owned but rented properties. This is for the reason that utmost of the fishers are meagre and they did not have the capability to build or buy their house. This is not in agreement of the results of Faruque and Ahsan (2014), who found 75.00–80.77% and 82.14–86.96%

of the fishermen's accommodation conditions where bricks were not used in the building materials of their houses.

### 3.3.7 Health Facilities

The wellbeing of the fishers and their family is an indication of the lifestyle that those people live in. The health amenities offered to the fishermen were not up to the standard and not reasonable. From this investigation showed that the fishers received health service from unskilled, nonprofessional village doctor (84.5%). Medium advanced health facilities are only found in the hospitals at the City of Fao that is located to the estuary of Shatt al-Arab River, and it is in a distance to reach by the fishers and their families.

### 3.3.8 Hygienic Facilities

The hygienic state of the fishers in the studied area was very poor. The toilets used were not provided with standard hygienic needs. Findings of the present study agreed with the results of Faruque and Ahsan (2014), who found about 92% of fishermen's toilets lack the basic health needs.

### 3.3.9 Revenue of Fishermen

Income has the greatest significance when accepting of the socio-economic circumstances of anglers (Kostori 2012). The results of the survey have shown that the families spend more when their income is high and spend less when their income is low. The fishers usually borrow money when the catch rates drops down. In some cases, the low catching rate continues for longer time, which leads to kind of poverty where fishers and their families face ill health and serious diseases emerged. Usually, boat owners earn more than labours. During the peak of fish catch, fishermen earn about 20–30% of their usual income. This case is similar to that reported by Kostori (2012) from Bangladesh.

## 4 Conclusion

Socio-economic condition of estuarine fisherman groups was shown according to the following factors: age structure, family size, housing condition, etc. The fishermen were dispossessed of many facilities such as population pressure, low income, lack of substitute employment chances, theft robbing, etc. Fishers also faced numerous problems such as child education, health facilities, food consumption and pasting of savings during low catch season. Nearly all fishers surveyed had shortage of capital

and the unavailability of feasible substitutes during the hard season (low catch season) as their main problems. Petition, obtainability, conservation means, etc. designated that it is a segment of the population with massive prospect bearing crucial inventiveness to elevate the livelihood of this group of the society by looking for another incomes, most importantly during the low catch season.

## References

- Al-Hassan LAJ (1999) Shad of Shatt Al-Arab river in Iraq- a brief review of the biology of shad that spawn in the Satt AlArab river in southeastern Iraq. *Shad J* 4(2):1–4
- Ali H, Azad MAK, Anisuzzaman M, Islam S (2005) Livelihood status of the fish farmers in some selected areas of Tarakanda Upazila of Mymensingh District. *J Agrofor Environ* 3:85–89
- Almukhtar MA, Jasim W, Mutlak F (2016) Reproductive biology of Hilsa Shad *Tenulosa ilisha* (Teleostei: Clupeidae) during spawning migration in the Shatt Al Arab River and southern Al Hammar marsh, Basra, Iraq. *J Fish Aquat Sci* 11(1):43–55
- Chantarasri S (1994) Integrated resource development of the Sundarbans Reserve Forest. Report on resources management for the Sundarban Reserve Forest. UNDP/FAO, BGD/84/056, Khulna. Bangladesh 1994:5–171
- Ellis F (2000) Rural livelihoods and diversity in developing countries. Oxford University Press, p 2000
- Faruque MDH, Ahsan DA (2014) Socio-economic status of the Hilsa (*Tenulosa ilisha*) fishermen of Padma River. *Bangla World Appl Sci J* 32(5):857–864
- Haque MA, Hossain MD, Jewel MAS (2017) Assessment of fishing gears crafts and socio-economic condition of Hilsa (*Tenulosa ilisha*) fisherman of Padma River, Bangladesh. *Int J Fish Aquat Stud* 5(2, Part C):177–183
- Hossain MI, Siwar C, Mokhtar MB, Dey MM, Jaafar AH (2009) Socio-economic condition of fishermen in seasonal floodplain Beels in Rajshahi District. *Bangla J Soc Sci* 4:74–81
- Hussain SA, Al-Mukhtar MA, AlDaham (1991) Preliminary investigation on fisheries and some biological aspects of Shour, Hilsa lilisha, from Satt Al-Arab river, Iraq. *Barsah J Agric Sci* 4 (1 and 2):141–151
- Islam MR, Galib SM, Rahman MA (2013) Livelihood of the fishermen in Monirampur upazila of Jessore district. *Bangla J Fish* 1:37–41
- Jabir MK, Faris AA (1989) Fecundity of sbour, *Tenulosa ilisha* (Hamilton–Buchannan, 1822) in the Shatt al–Arab River, Basrah, Iraq. *Marina Mesopotamica* 4(2):281–296
- Jawad LA (2012) History of the study of the fish fauna of Iraq. *Water Res Manage* 2(3):11–20
- Kabir KR, Adhikary RK, Hossain MB, Minar MH (2012) Livelihood status of fishermen of the old Brahmaputra River, Bangladesh. *World Appl Sci J* 16(6):869–873
- Kostori MFA (2012) Socio-economic condition of fishermen of the Chalan Beel under Tarash Thana of Sirajgonj in Bangladesh. *Bangla Res Publ J* 6(4):393–402
- Mohamed ARM, Qasim AM (2014) Stock assessment and management of Hilsa shad (*Tenulosa ilisha*) in Iraqi marine waters, northwest Arabian Gulf. *Int J Fish Aquat Stud* 1(5):1–7
- Patiris DL, Tsbarris C, Anagnostou CL, Androulakaki EG, Pappa FK, Eleftheriou G, Sgouros G (2016) Activity concentration and spatial distribution of radionuclides in marine sediments close to the estuary of Shatt al-Arab/Arvand Rud River, the Gulf. *J Environ Radioact* 157:1–15
- Sarma CJ (1984) Oceanographic study in the Strait of Hormuz and over the Iranian shelf in the Persian Gulf. Final report for Office of Naval Research. Geography Program, Arlington, VA
- Sheppard C, Al-Husiani M, Al-Jamali F, Al-Yamani F, Baldwin R, Bishop J, Benzoni F, Dutrieux E, Dulvy NK et al (2010) The Gulf: a young sea in decline. *Mar Pollut Bull* 60:13–38