

## Commercial Fishing and Marketing of Hilsa Shad *Tenualosa ilisha* (Hamilton-Buchanon, 1822) in Basrah -Southern IRAQ

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**Abstract:** A field and reference study was conducted for the fishing and marketing operations of Hilsa Shad *Tenualosa ilisha* in the commercial center in Basrah. The data collected from fishermen and retail-salesmen and compared with the fishing data in the previous years. Fishing production divided into three periods: 1965-1974, 1990-2002 and 2003-2007. The highest Hilsa Shad fishery production was in the 2002 (nearly 12000 tons) with total fishery production of 22918 ton. The Hilsa Shad accounted for 48% of the total fishery production during 1965-1974, which was the highest, compared to the second and third periods (28% and 12% respectively). There might be many reasons for this temporal change over fishing for the previous years, pollution and no regulations to protect the marine fish stock. Marketing of Hilsa Shad occurred mostly in Basrah Governorate with prices ranging between 1.5 and 2 \$/fish in 1965-1974 and 4- 6 \$/fish in the recent years for a medium sized fish (30-35 cm total length).

**Keywords:** Catches, Fishing, Marketing, Hilsa Shad, *Tenualosa ilisha*.

### شاد (هاميلتون بوكانون ، 1822) في *Tenualosa Hilsa ilisha* الصيد التجاري والتسويق في البصرة ، جنوب العراق

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**المخلص:** أجريت دراسة ميدانية ومرجعية لعمليات صيد وتسويق الصبور *Tenualosa ilisha* في مراكز بيع وتسويق الأسماك في البصرة. تم جمع المعلومات من صيادي الأسماك في منطقة الفاو (المركز الرئيسي لتسويق الصبور) ومن بائعي المفرد في منطقة البصرة ومقارنتها مع كميات الصيد في السنوات السابقة اعتمادا على بيانات دائرة الزراعة والمصادر. وزعت كميات الصيد إلى ثلاث فترات الأولى من 1965-1974 والثانية من 1990-2002 والثالثة من 2003-2006، اعتمادا على الظروف التي شهدتها المنطقة والمؤثرة على فعاليات الصيد خاصة جنوب العراق. يلاحظ إن اعلى كمية صيد الصبور كانت في سنة 1995 (حوالي 26000 طن) مقارنة بالسنوات الأخرى مع إن الصيد الكلي للأسماك كان اعلى في سنة 1996. بينما بلغت نسبة صيد الصبور للصيد الكلي 47% للفترة 1965-1974 وهي الأعلى مقارنة بالفترتين الثانية والثالثة (15 و 16 % على التوالي) وذلك لعدة أسباب أهمها الصيد الجائر للسنوات السابقة والتلوث وعدم وجود أي إجراءات لحماية المخزون السمكي البحري. أما أسعار بيع الصبور (بياع على أساس العدد وليس الوزن) الذي يباع أساسا في البصرة فتراوح بين 1.5-2 دولار/ سمكة في 1965-1974 بينما وصلت الأسعار بين 2.5-4 دولار/سمكة في السنوات الأخيرة للأحجام المتوسطة (30-35سم طول كلي).

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## Introduction

Hilsa Shad (*Tenualosa ilisha*) which is also called the Indian shad (locally known as Saboor) and considered a major source of fish food in India, Pakistan, Burma and the Arabian Gulf, occurred in rivers and estuaries as an essential part of its fisheries (Al-Hassan, 1999). The fish classified for the first time by Russel, (1803) in the coastal waters of the Vizagapatan and given name Palash. It was then classified by Hamilton in 1822 under the name *Clupanodon ilisha*. The species is widely distributed throughout the northern parts of Arabian Gulf to the coast of Pakistan, east and west coast of India and the coast of Bangladesh and Burma, also it was recorded near the coasts of China (Pillay and Rosa, 1963).

These fish enter estuaries and rivers for spawning in different dates and duration in different regions. In the Shatt Al-Arab it was found from March to September (Hussein et al., 1991; Hussain et al., 1994; Jabir, 1995). Which is attributed with the spawning migration that begins as early as February with a peak at the end of March and beginning of April (Coad, 1997).

*T. ilisha* may reach up to Qalaat Salah on the Tigris River and to Al-Fahod on the Euphrates River about 150-180 km north of Basrah (Al-Dham, 1977).

Recently it was recorded in the artisanal fisheries in the lower parts of Tigris, Euphrates during 2005 (Mohamed et al., 2008) and Mohamed et al. (2009) recorded the species in the East Hammar Marsh north Basrah and represent 10.1% of the total catch. Mohamed et al. (2001) studied the stock assessment of *T. ilisha* in Iraqi marine waters.

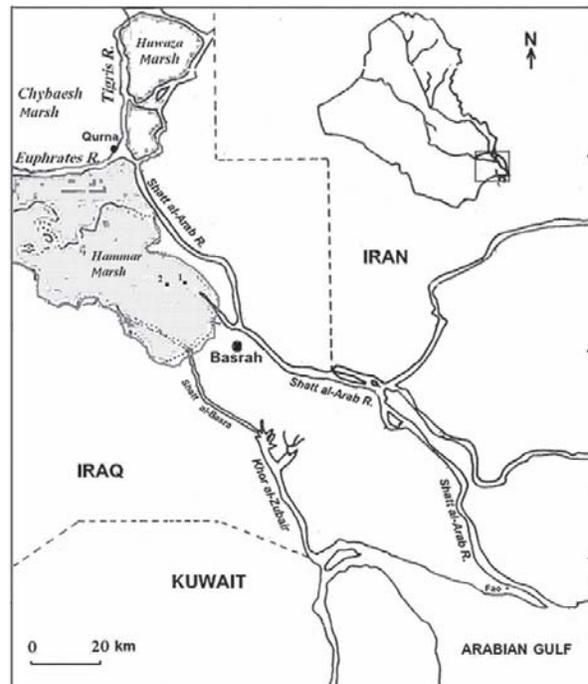
Hilsa Shad fishing season starts in March to August and sometimes extended to October (Al-Hassan, 1999). The catches of the species fluctuated in different years especially in the coastal waters of Iraq for several reasons including the conditions that the region faces through previous periods. More than one attempt was conducted on fish marketing in Basrah province by (Al-Nasiri and Sharma, 1977, Salman, 1979, Al-Khayat, 1978, Salman, 1983).

The object of the current study is to evaluate commercial fishing methods and catch of Hilsa Shad in Basrah during 1990-2006 to compare it with previous periods, and describes marketing operations in the Fao City, the central market of Hilsa Shad in Basrah.

## Material and methods

### Study area

The study was carried out in Fao City which located 100 km south Basrah City (Figure 1), the Iraqi marine waters occupy the most Northwestern tip of the Arabian Gulf, the fishing grounds valid for exploitation is about 750 km these grounds divided into three main regions i.e. Shatt Al-Arab estuary, Regional Iraqi waters and Khor Abdulla (Ali et al., 1998). For higher commercial catches, fishermen operate mainly in the deeper marine water around Fao city rather than at the estuary of the Shatt al-Arab River (Jawad, 2006).



**Figure 1. Map of southern of Iraq, showing the location of Fao.**

### Data collection

The raw data of all fish landing including Hilsa Shad were obtained from the Department of Agriculture that depended on the Fao

Association (formerly known Al-Naaser) and the Sinbad Association for fishermen in Fao, which covered the periods from 1990 to 2007.

While for the previous, it obtained from the studies on fish marketing in the region (Al-Nasiri and Sharma, 1977, Salman, 1979, Al-Khayat, 1978, Salman, 1983).

The information of fishing and marketing obtained directly from periodical field visits to Fao in 2006, interviews with the fishermen, wholesaler and retailer.

## Results

### Hilsa Shad fishing method

Currently 750 boats registered in the Fao association and 215 boats registered in the Sinbad association, in each boat between 10-12 people working, so the total number of fishermen between 9650 - 11,580 in addition to another number working in small boats which counted 600 boats, between 2-3 fishermen work in each of them.

Chalybeate boats were used (locally called "Lanche") in addition to a small number of wooden boats. The gill nets (locally known as "Sayasi") used mainly in Hilsa Shad and other fish species fishing beside other fishing methods to catch shrimp and other fish. Different measurements of mesh size are used and it named according to the number of meshes in one arm long (about 50 cm), the common one was Alsudeissi (6 meshes / arm) and Alosari (10 meshes / arm).

The proceeds divided equally between the owner and workers, net profits were consider after subtraction trip cost from the revenue. Trip cost amounts to about 700-800 dollars /boat include fuel, ice, food and maintenance in addition to 2% paid to the association for which the fishermen belong. Fishermen estimated the net profit of a trip between 1500-3000 dollars / boat that lasted between 4-10 days.

### Hilsa Shad Catches

Figure (2) shows the total Shad fishing in the years 1990 to 2006, where the highest catches (nearly 12,000 tons) was in 2002. When comparing the catch of the Shad for different years, the rate limits landings around 6000 tons / year with some fluctuations from year to year.

The percentage of Shad fishing from the total fishing (Figure 3,4) showed a commensurate increase with direct correlation with the overall fishing which was higher in 2002 (about 23,000 tons). As shown in figure (5) the Shad fishing percentage from total fishing was highest in the period between 1965 -1974 (56.9% ), while it was much lower in the other two periods in 1990-2002 and 2003 - 2007 (38.9 and 5.1% respectively). The average shad catch was around 2500 Kg while the majority quantity did not exceed 1000 kg (Figure 6).

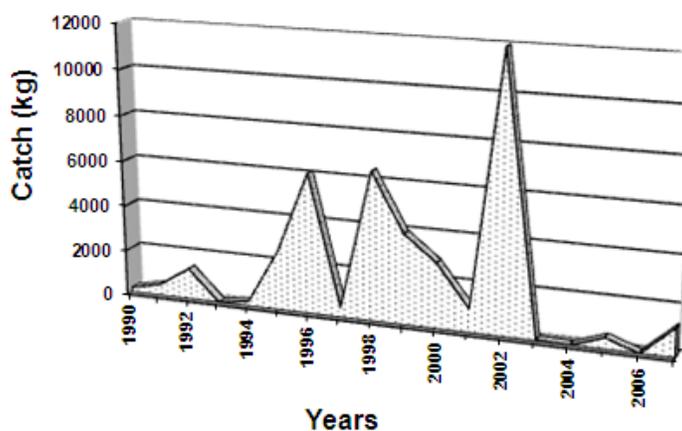


Figure 2. The total Shad fishing in the years 1990 to 2006 from Fao- Basrah.

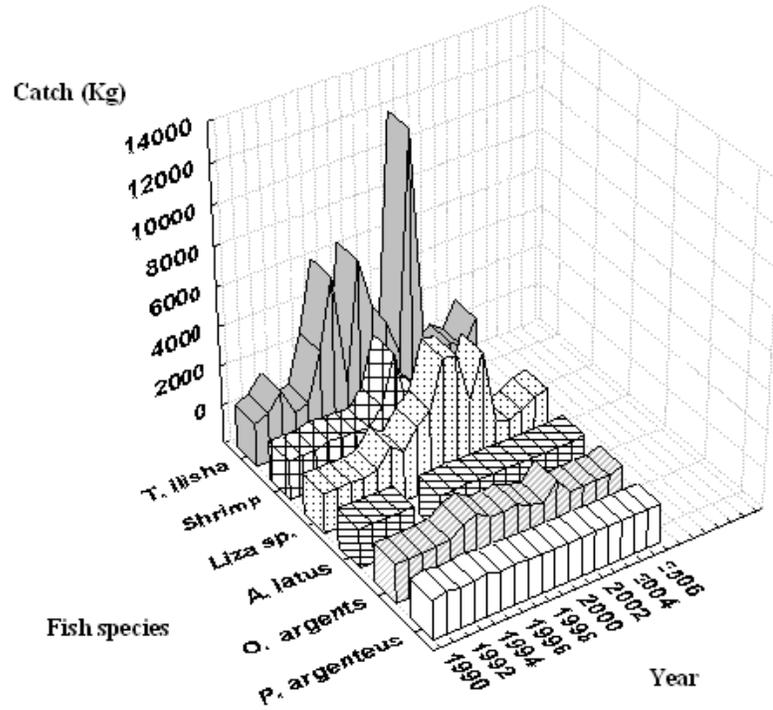


Figure 3. The amount of Shad fishing and other species fishing in the years 1990 to 2006 from Fao- Basrah.

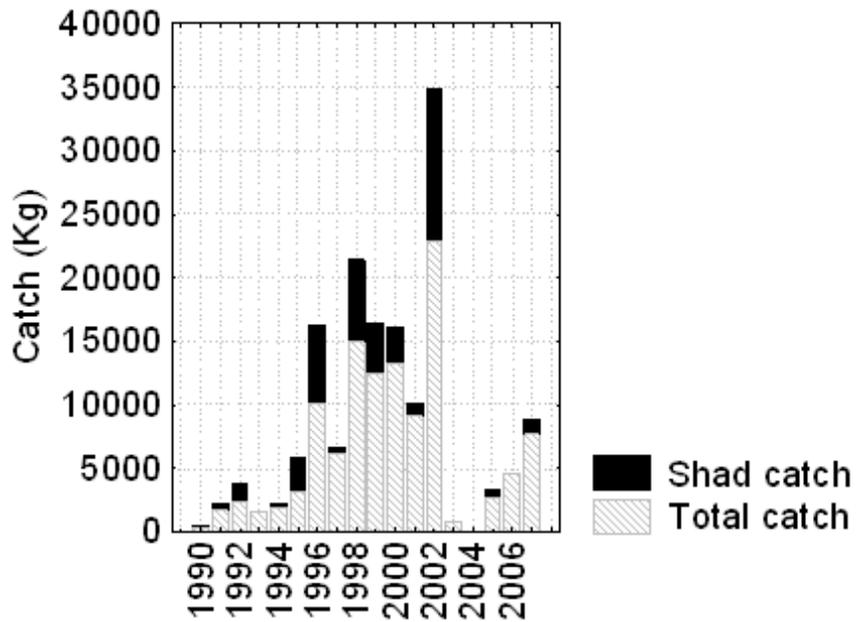
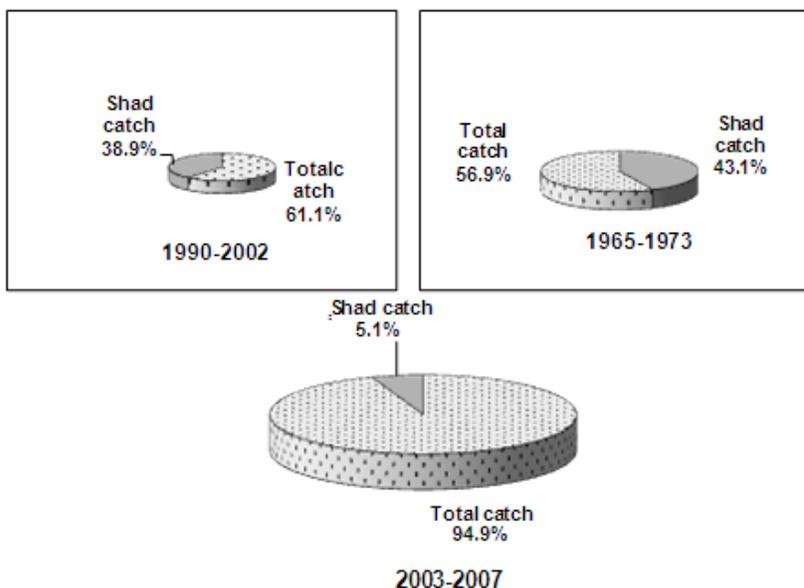
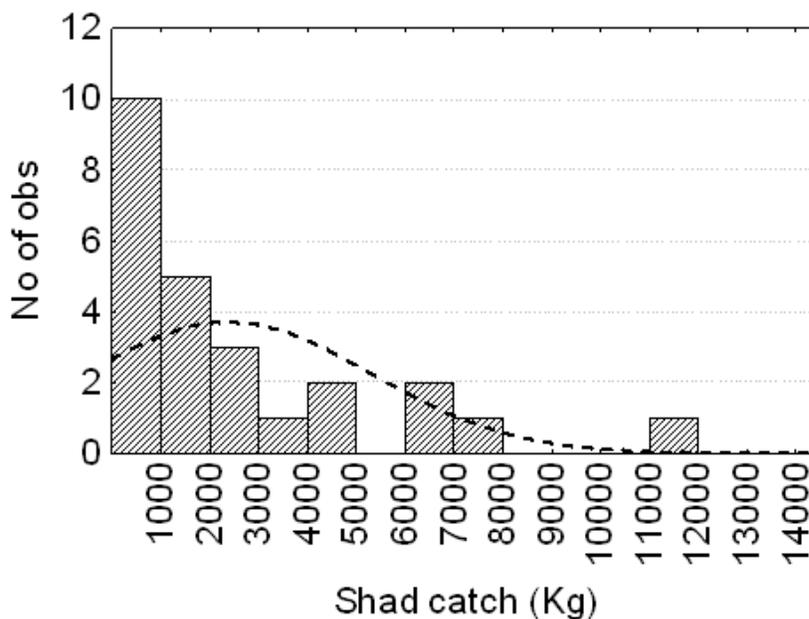


Figure 4. Shad catch compared to total catch the years 1990 to 2006 from Fao- Basrah.



**Figure 5. Shad catch percentage compared to total catch in the years 1965 to 2007 from Fao- Basrah.**



**Figure 6. Average Shad catch in the years 1965 to 2007 from Fao- Basrah.**

### Hilsa Shad Marketing

Fishermen use ice blocks after scrapping it to small pieces (100 - 120 blocks / trip) to preserve commercial fish, including Shad, on the boat until access to the sale center in the Fao which called locally "Alalloa," Shad was sold on the basis of the fish number rather than

weight like other fish. The Shad catches gathered in the center ground that divided into square sectors and sold in the auction under the auspices of the Association. Generally the Shad allocated to three size groups (large - intermediate - small) the price of large fish ranging between 2.5 -3 dollars / fish, medium

1.5-2 dollars / fish and small 0.5 -1 Dollars / fish at wholesale prices.

Then Shad transferred in particular to the markets of Basrah, as it is not preferred in other areas of Iraq, small and medium-sized trucks used to transport fish preserved with ice covered by thick cloth. The Shad sold neither in other auction in the sales center in Basrah, nor directly to retailers. Retailers in turn offer single fish in small shops or so-called "Basteia", which is a metal table. In all above stages fish preserved with ice, freezing method not used even for long-term preservation of Shad for two reasons instability and lack of electricity and its effect on fish consistency after thawing. Retailers add a profit margin on the Shad's original price ranged between 0.5 – 2.5 dollars / fish where the margin increased with the size of fish and scarcity of supply.

### Discussion

The numbers of fishermen now represents a high skip over previous years, where Al-Khayat, (1978) recorded the licenses number granted for fishing vessels in the Southern provinces (mainly Fao) 345 for the years 1965-1974. Salman (1983) showed that the number of workers in the fishing profession reached more than 1000 workers working on 73 large ship and 283 small boats in 1983. All workers in the maritime fishing sector in the seventies and earlier were residents of the Fao city, but in later periods, fishermen from other areas in Basrah join this sector, especially after Southern Marshes drainage and the scarcity of fishing in it, in addition to increase in the number of the total population of Iraq.

Fishing methods did not change, where the same nets used in previous periods (Al-Khayat, 1978, Salman, 1983), beside Drift net that is similar to the method of gill net in the mechanism of catching fish (Jawad, 2006). In the Iranian waters, *T. ilisha* caught with traps, weirs, and gill nets on the spawning migration (Coad, 1997).

Most of the fishermen agreed that the Association did not provide any services in return for the ratio they paid in recent years and by not justify the existence of any government support them. Jawad (2006) stated that Fishers

in both marshlands and marine habitat are currently working without any regulations.

Currently high costs of trip and low income of the workers compared with previous years in which Al-Khayat, (1978), estimate the average income per capita working in fishing generally amounted to 600 dollars in 1974, while Salman, (1983), estimated the value of catches per season range between 30000-45000 dollars / boat associated with low landings and increasing in trip demanding. Social and religious factors have marked effects on the behavior for food and income (Jawad, 2006). In the marine habitats, even greater numbers of scaleless fish species are usually present in the catch, such as *Muraenesox cinereus*, *Arius thalassinus*, and *Trichiurus lepturus* (Hussain et al., 1988), by-catch may also include several fish, which also forbidden as food items by religion and thus represent an additional income loss.

According to Agriculture Department, Hilsa Shad catch data appears to be very large compared to previous years and other neighboring regions. It was 8,000 tons for the years 1965-1973 and about 3,000 tons in 1978 (Al-Khayat, 1978, Salman, 1983). Catch did not exceed 700 tons in Kuwait in 1990 (Al-Matar et al., 1990), and 5000 tons in Southern Iran (Coad, 1997).

The large figures of catches, while it was not very precise, but indicate that fishing in 2002 went up significantly. In that period, the fuel share of boats linked to the trip periods and catch therefore fishermen adopted many ways to obtain additional quantities of fuel to sale through invalid fishing data. The absences of other reliable sources for data to compare make it difficult to get the real numbers.

The fluctuation in Hilsa shad catch adopted in different periods associated with the circumstances through which the region faced that affecting fishing activities in Southern Iraq. In the eighties no fishing activity has been reported due to the Iraq - Iran war.

*T. ilisha* constitute about 50% of the total commercial catch during 1990 – 1994 (Ali et al., 1998), Mohamed et al. (2002) reported that shad caught represent more than 50% of the total fishery production in 1995 to 1999 from

all marine Iraqi waters, where its annual exploitation rate reach 0.52. These percentages represented the expected occurrence of Shad in Iraqi waters especially in last decade.

In southern Iran, *T. ilisha* catches have been as high as 401 tons, with similar catches at Basrah in Iraq (Coad, 1997). While in Kuwait the average annual landings of this species in 1981 – 1989 was 152 tons constituted only 2.5% of commercial fish landings (Al-Baz and Grove 1995). Ahmed et al. (2008) clarified that *T. ilisha* as a single species contributes over 13% of national fish production in Bangladesh.

All fishermen complain to lower total fishing, especially Shad, in recent years, where the amount did not exceed 490 tons in 2005. This attributed to the limited Iraqi territorial waters (the shoreline about 50 km) available for fishing, they could not go beyond it because of the circumstances surrounding the area, their supplies and fish being beleaguered and ravage by neighboring authorities.

In spite the low Shad fishery in Iraq compared to other countries, such as Bangladesh where about 16% of the country's total fish production (1.3 million tones) is generated by this fishery (Nurul Amin et al., 2002). The current study showed that there is an increase in the workers number in marine fishing sector in recent years offset decrease in catches, thereby reducing the revenues of fishermen and increasing fishing effort to obtain sufficient quantities of fish, which in turn affects fish stocks, as it was found by Jabir (1995), that the rate of exploitation of the Shad was 0.8, which indicates that this fish exposed to overfishing in the Shatt al-Arab.

Al-Noor, (1998) indicate the need to limitation the numbers of fishermen, especially at the beginning of the mouth of the Shatt al-Arab (fao) to ensure the arrival of large numbers to the freshwater in the river, which is a spawning area to Shad. Further Ali et al. (2001) found that annual fluctuation of fishery landing in the marine Iraqi waters highly correlated with the fishing efforts.

In addition, there are impacts on the environment have led to limited stocks of fish (especially the Shad), including pollution and industrial and household wastes. Also the war

which hit the Gulf fisheries and damaged it directly and indirectly (FAO, 1993), beside oil pollution which recently significantly increased. Oil spills observed on banks of the Shatt Al-Arab due to download particularly in the "Abu-Floos" port, which is located north of fao (70 km) with methods lead to the leakage of large quantities from petroleum derivatives.

There is a rising trend in prices for the Shad because of the high costs of operating and lack of supply proportion to demand. The estimated consumption per capita of fish in Iraq between 1 - 1.6 kg / year, while it was 6 kg / year for the period from 1976 -1980 (Al-Khayat, 1978) and it was expected to rise to 15 kg / year in subsequent years (Tech. Eco. Rep., 1971). Shad and marine species prices in Basrah was less compared to other governorates, but it is expensive attributed to family income and currently frozen imported marine and freshwater fish could not lower prices to acceptable one, where it come in the second degree in the Iraqi consumer preference. In Iraq, there is a law of "The Exploitation of Fishing and Aquaculture" No. 48 in 1976. However, it was firstly did not mention the marine fishing, where it was referred in Article 9 of Chapter II that there will be a special regulation for fishing in Iraqi territorial waters, which it had not been established and secondly because the applicable conditions law for the protection of fisheries especially in the last years.

### Conclusions

Fish marketing process requires many actions especially fish handling and transfer until it arrival to consumer. In the current circumstances fish were damage, vulnerability to various weather conditions and no healthy conditions at all stages. However the absence of any fish storage places or manufactures, neither a serious oversight nor supervision of concerned sectors on fishing and selling where it controlled totally by the private sector raise the west and affect prices of Shad.

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