

## RESEARCH ARTICLE

## BOAL (WALLAGO ATTU) FISH ABANDONMENT IN KELEGHAI RIVER, WEST BENGAL: AN IDEA BASED CLARIFICATION

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## ABSTRACT

Aquatic freshwater fish diversity immensely declines from several native places in West Bengal. Lots of freshwater fish have been extricated and some become endangered or vulnerable in condition as well as in Keleghai river. Aquatic ecosystem meltdown or crisis due to anthropogenic intervention resulted disappearance of eco-sensitive species. Such, appearance of Boal (*Wallago attu*) fish in this river was very common but now it's very amazing to see or to catch it. The number of this species decreased radically before some decades. The present study conducts an empirical investigation to find out the reasons are behind it. Lacking of printed information, the work concentrated on knowledge and perception of experienced fisherman for understanding the fact by interviewing method. After qualitative investigation, the study recommends that simplification of food web in this aquatic ecosystem is the major cause of abandonment of Attu fish in this river. Other important causes are advance unethical fishing techniques, habitat loss, and enormous use of chemical pesticide and fertilizer in wetlands.

## KEYWORDS

Fish diversity, food web, aquatic ecosystem, habitat loss, wetland.

## 1. INTRODUCTION

Attu fish is usually famous as helicopter catfish. Generally, this species is found in South East Asia in rivers, lakes, wetlands, floodplains, tanks, beels, haors, jheels and adjoining river canals (Talwar et al., 1991; Roberts, 1993; Tripathi, 1996). Typically, it has several names i.e. Boal in Bengali, Nga in Burmese, Attu Valai in Malayalam, Sareng in Manipuri, Baloo in Marathi, Bohari in Nepali, Boallee in Odia, Valai in Tamil and Valaga in Telegu in India. Becoming a higher tropic level predator, Boal fish plays a significant role in aquatic freshwater ecosystem (Gupta, 2015; Sahoo et al., 2006; Raizada et al., 2015). Feeding behaviour is carnivorous in nature. This aquatic predator consumes all aquatic faunal species actively from top to bottom of the habitat besides fish fry, insects, crustaceans are listed in their food list (Karamchandani, 1957; Alikunhi, 1957; Hora, 1962; Islam et al., 2006; Thella et al., 2018). Therefore, this fish has an identity as freshwater shark (Hora, 1962).

Keleghai river basin was a full stock of aquatic faunal species ones upon a time (Jana et al., 2015). During rainy season both sides of the river bank were flooded. In the flood plain fisherman caught this fish by using different traditional fishing techniques. During this season, different sizes (range between 0.5 kg to 1.5 kg) of Attu fishes were found in nearest market. Occasionally, big Attu fish was also caught by fisherman and that was an incident also. Manly, during summer when river become dry up and shallow in condition then big Attu fish caching event or news were coming from different riparian villages through verbally. In many folk stories, Attu fish also played a relative character. Therefore, this fish has a

great importance in an aquatic ecosystem as well as in economy, culture and society in riparian villages in Keleghai river basin. But now the situation is meltdown. Both aquatic flora and fauna diversity become declined due to several causes related to human intervention (Mahapatra et al., 2014). Repeated channelization process hampered the existing ecosystem. Thus, Boal fish may be vulnerable or at risk. This Attu fish has an unambiguous identification in riparian society in the surroundings areas of Keleghai river.

Generally, Attu fish habitat movement and utilization pattern is very area sensitive (Bhattacharjya et al., 2017). They prefer deeper water for their habitat performance but they come into shallow water at the time of predation. Predation period is also very time dependant. Predation activities are dominant and common in night time than day time. They prefer to stay alone or individually through their life span except in breeding time. Experience fisherman said that Attu fish always found near the group of small size fishes like in Morla (*Indian carplet*) fish in this river. Other small size fishes also have in their food list as well as other different aquatic faunal species also.

Generally, Boal fish huge appearance is adequate in upper and middle catchment areas of Keleghai river except lower catchment portion where tidal effects are common (Jana et al., 2015). It's very difficult or hard work near to the fisherman to catch this fish because of its large size, cleverness and power than existing fishes in this river. At present time occasionally it caught by fisherman from river and surrounding areas. Its occurrence was regular in fish market but now is very special and precious also. Now the question arises why this condition has happened and why this fish did not

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survive in aquatic ecosystem in Keleghai river as well as its surrounding areas. Extinction of species from an ecosystem has several reasons like imbalance of ecosystem, landuse alteration, changes in food chain, introduction of new species etc. The main intent of the present study is to find out the specific reasons for Boal fish abandonment from Keleghai river.

**2. METHODOLOGY**

**2.1 Study area**

Keleghai river and its tributaries cover blocks like Dantan-I, Narayangarh, Sankrail, Kesiary, Patashpur-I, Bhagbanpur, Sabang and Mayna. Aquatic freshwater fish diversity is seen profoundly in Patashpur-I and Sabang block than others. The ancient village economy was regulated by the fishing activities from this river. Varieties of aquatic fish species were found in different seasons. Respectively the varieties become declined. In parallel way, Boal fish is seen or noticed infrequently in riparian villages or daily fish market from these blocks from few decades. Geographically, wet and marshlands are well connected to Keleghai river in these two blocks that support suitable habitat for Attu fish during at rainy season.

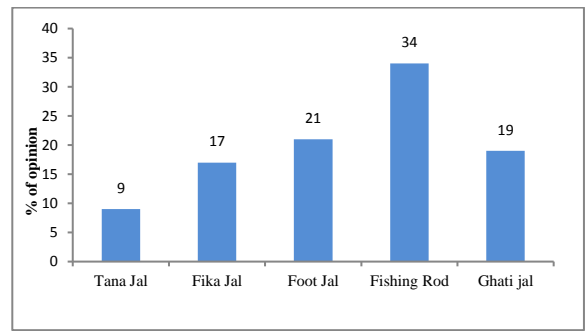
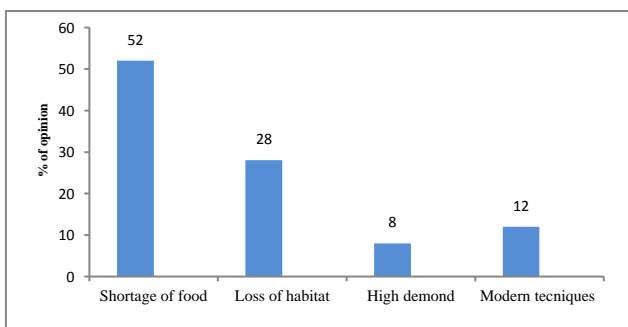
**2.2 Methods**

The main objective of the present study is to search the causes of abandonment of Attu fish in Keleghai river. The present and past aquatic situation of the river is very important background for the study. So, the historical perspective is very needful to understand the present situation. Lacking of sound full literature or research about habitat behaviour of Attu fish in this specific aquatic area, the present study gives more stress in qualitative information such as experience, idea, knowledge and field inquiry. For that purpose, the study conducts a deep field investigation through questioner survey. Mainly, the oldest experienced fishermen are chosen from adjoining villages like Gopalpur, Selmabad, Kanakpur, Guadangri, Gokulpur, Barbaria, Rathravari, Nedhua, Dhamsai, Kaptipur, Jalisai, Taladiha, Amgachia, Chingravari, Talchitkini, Gaurchak and Daridhar for this survey. To full fill the objective reliable question is set up. The first question is what is the reason behind the abandonment of Attu fish from river Keleghai? Second one is what are the methods used and what substance they have been used as fishing baits to catch this fish? From this question, we predict the food habits of this fish which is very important for this study. Further, it helps to understand the changing pattern in aquatic species diversity in this river. Ultimately, 69 fisherman's information was collected to predict the situation. Fish market survey was also conducted to verify the concept of fisherman. The study gives stress on Fish Sheller and customer opinion about the supply of small fish from surroundings areas compare with the past to present. The information was collected by interviewing method. We put the information in the questioner sequentially.

**3. RESULTS**

**3.1 Causes of abandonment of Attu fish**

In the questioner, four specific reasons are prescribed near to the informer. These are (i) shortage of food that means inefficiency of aquatic faunal species in their food chain, (ii) losses of habitat means modified aquatic ecosystem to other ecosystems, (iii) high demand in society for test and food and (iv) modern techniques means traditional to modern method to catch this fish. 52% of respondents claimed that shortage of food in their food chain is the main cause of abandonment of this fish (Figure 1). Loss of habitat is the cause claimed by 28% of respondents. Modern techniques are responsible for this fact claimed by 12% and only 8% of respondents claimed high demand for this fish in society is the cause of abandonment of this fish from river Keleghai. The statistics shows that shortage of foods that means loss of lower-level aquatic species number diversity is the main cause of abandonment of Boal fish from this river.



**Figure 1:** Graphical presentation of respondent opinion about cause of abandonment of Attu fish and most suitable techniques for catching this.

**3.2 Fishing methods**

Indirectly, fishing method is very crucial fact to understand the feeding behaviour and the availability of food amount of Boal fish in this river. It is may be the best way by which we can establish the Attu fish feeding behaviour. From the questioner information, five types of major fishing techniques or methods find out to catch this fish from river basin (Figure 2). These are (i) by netting-locally name tana jal, (ii) by hand throwing net-fika jal, (iii) by current net- arra jal, (iv) by fishing rod- barshi and (v) by crossing net- ghati jal. 34% of respondents stated that fishing rod (tanga) was the best method by which they caught this fish. 21% fisherman claimed that current net was the best method. 17% fisherman thought that hand-throwing net was the best method and 19% fisherman thought crossing net and only 9% fisherman thought that netting method was the best method to cache this fish (Figure 1). The most perfect method to catch Boal fish is the fishing road. This is the technique by which different suitable substance are used as a baits to catch this fish. Feeding behaviour of Boal fish could be known from these using baits.



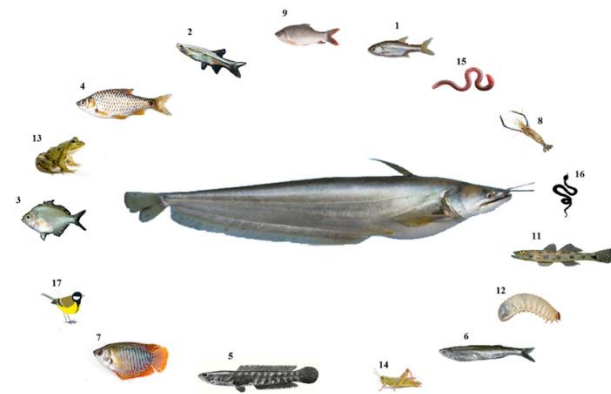
**Figure 2:** Different types of traditional fishing methods used for fishing Attu fish. (A) Hand throwing net, (B) Fishing reel and rod, (C) Current netting and (D) Tanga barsi.

**3.3 Substance used for caching Attu fish by fishing rod (Tanga)**

It is cleared from the above result that the fisherman mostly likes to catch this fish by tanga i.e. one type of traditional fishing method (Gupta, 2015). They use a fishing rod with a strong hook attaching a live fishing bait like small fish or favourable substance. The present study tries to know the food habit of Attu fish, asked the fisherman what substance or small fishes as fishing baits they have been used to catch the Attu fish from this river (Kumbar et al., 2014; Mahapatra et al., 2015). Number of aquatic species, insects, earthworms and human food materials were suggested by fisherman as fishing bait used by them (Kisku et al., 2017). These are listed in table-1. All of these species were present in the river ecosystem enormously in past. After getting the suggestions, the present study understands the food behaviour or position in the food chain of Attu fish in this river (Bhakta et al., 2008; Mrinmay Ghorai, 2018; Jana et al., 2015; Kundu et al., 2014). Further, it helps to know the reason for abandonment of this fish from this river.

**Table 1:** The list of fishing baits and the scientific name of aquatic species with their threat status used by fisherman for catching Attu fish from river by fishing rod. Choice of food of Attu fish also presents with considerable scale recommended by fisherman.

Sl. no	Local Name	Scientific Name	Level of choice	Threat status
Aquatic Fish Species				
1	Mourala	Amblypharyngodon mola	Highly	Vulnerable
2	Darkina	Esomus danricus	Highly	Critically Endangered
3	Chanda	Parambassis spp.	Moderately	Critically Endangered
4	Punti	Puntius spp.	Highly	Endangered
5	Lata	Channa punctatus	Moderately	Endangered
6	Chela	Salmostoma acinaces	Rarely	Extinct
7	Kholshe	Colisa fasciata	Highly	Critically Endangered
8	Galda Chingri	Macrobrachium rosenbergii	Highly	Vulnerable
9	Rohu	Labeo roheta	Rarely	Common
10	Chang	Channa orientalis	Highly	Extinct
11	Bele	Glossogobius giurus	Moderately	Extinct
Other diets				
12	Insects larvae	-	Moderately	<b>Fisherman used also deadliest part of molluscs, crab, large intestine of goat and chicane, human foods like Pauroti, wheat etc. as fishing bait in a hook.</b>
13	Indian water frog	Hoplobatrachus tigerinus	Moderately	
14	Grasshopper	Poekilocerus pictus	Moderately	
15	Earthworm	Lumbricina	Highly	
16	Small water snake	Checked keelback	Rarely	
17	Small Birds	-	Rarely	
18	Molecrickets (Ghurghuria)	Gryllotalpidae	Rarely	



**Figure 3:** Predator-prey relation and the position of Attu fish in the trophic level in the aquatic ecosystem of river Keleghai recommended by fisherman's man.

The researchers stated the similar results. They argued that small aquatic freshwater fish in Keleghai river is endangered in condition. Small size fish diversity loss in this river resulted in a trophic level disorder predicted. The present study states that small fish diversity loss is the prime cause for abandonment of Attu fish in Keleghai river.

#### 4.1 Causes for lacking of food source for higher trophic level species in the Keleghai river

The low lands in both sides of the river in this area are well connected with secondary canal and become flooded in rainy season. On that time aquatic species diversity especially lower trophic level species was full of stock in these wetlands. A very complex food chain was found with a balance ecosystem. Attu fish used to come in these flooded wetlands through the canal from main river. These wetlands have become a suitable ground for breeding and feeding. At that time fisherman were engaged to catch different fish by using traditional fishing equipment. Time of field survey we have seen such experience (Figure 3). Now in these wetlands, paddy cultivation is practised enormously by using heavy chemical pesticides and fertilizer just in the middle of the rainy season. These farming practices destroy the lower trophic level species and hampered the total wetland ecosystem. Now fewer Attu fish become alive with this imbalance condition and they go back into the main river after rainy season. But small aquatic species is unable to retreat to the river to complete their life cycle. This continuous process from few past years cut off the supply chain of food source in the river for higher trophic level species like Attu fish. So many factors are behind this fact recommended by the fisherman. Most important factor is habitat alteration from wetland to fisheries and huge paddy cultivation in the riverside areas. This process has multiple impacts on small aquatic fish species diversity. Heavy use of netting process by high dense net for fishing is another cause of unification of food chain in the river that unintentionally destroys the eggs of fish and small fishes. Now the river Keleghai is well channelized and dries up in summer season. That has not happened in the past. This is another cause of ecosystem break that leads destruction of existing trophic level as well as abandonment of *Wallago attu*.



**Figure 3:** An experienced fisherman Ganesh Mandal 52 years old from Gopalur village caught this Attu fish using Morola fish as fishing baits by Tanga- the most perfect and usable traditional fishing method to cache this fish. The pictures were taken at the time of field visit in 10/06/2019.

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#### 4. CONCLUSIONS

From the above table information, the present study understands the food chain characters and function in Keleghai river. Attu fish is the higher trophic level species in aquatic food chain ecosystem (Figure 3). Becoming a high predator, Attu fish subsistence in this river depends on a stable lower trophic level quantity. Any imbalance in this particular food chain disturbed the higher trophic level species existence enormously. Similar situation also predicts from respondents' comments. They stated that number or number of small fish in lower trophic level in this river gradually declined during few past years. Losses of ecosystem complexity in the river is the main cause. River reforms, land reclamation for agriculture, embankment etc. projects are launched in recent past in this river. Suddenly these activities create disorders in aquatic ecosystem. The amounts of Mourala, darikina, chanda, Ponti, chela, kholshe etc. are gradually decline from this river ecosystem. The downing effect directly hampered the traditional food habit of Attu fish. That's why the number of Attu fish becomes abandonment in this river due to lack of small fish in the aquatic ecosystem. They also argued that catching of Attu fish by any fisherman is now an interesting event not in common like in past. So, the two statements of fisherman are showing a relation between aquatic food source and abandonment of Attu fish in Keleghai river.



## REFERENCES

- Alikunhi, K.H., 1957. Fish culture in India. Farmers Bulletin of Indian Council of Agricultural Research, Pp. 20-144.
- Bhakta, J.N., Bandyopadhyay, P.K., 2008. Fish diversity in freshwater perennial water bodies in East Midnapore district of West Bengal, India. International journal of environmental research, 2 (3), Pp. 255-260.
- Bhattacharjya, B.K., Bhaumik, U., Sharma, A.P., 2017. Fish habitat and fisheries of Brahmaputra River in Assam, India. Aquatic Ecosystem Health & Management, 20 (1-2), Pp. 102-115.
- Ghorai, M., 2018. Diversity and Present Conservation Status of Fish Fauna in the Rupnarayan River at Kolaghat of Purba Medinipur District of West Bengal, India. IJSDR, 3 (2), Pp. 115-123.
- Gupta, S., 2015. Wallago attu (Bloch and Schneider, 1801), a threatened catfish of Indian waters. International Journal of Research in Fisheries and Aquaculture, 5 (4), Pp. 140-142.
- Hora S.L. and T.V.R. Pillay. 1962. Handbook of fish culture in the Indo-Pacific Region. FAO Fisheries Technical Paper, 14, Pp. 204.
- Islam, M.S., Rahman, M.M., Halder, G.C., Tanaka, M., 2006. Fish assemblage of a traditional fishery and the seasonal variations in diet of its most abundant species Wallago attu (Siluriformes: Siluridae) from a tropical floodplain. Aquatic Ecology, 40 (2), Pp. 263-272.
- Jana, A., Sit, G., Maiti, K., 2015. Ichthyofaunal diversity of Keleghai river at Medinipur district in West Bengal. International Research Journal of Basic and Applied Sciences, 1, Pp. 24-26.
- Karamchandani, S.J., 1957. On the occurrence of associates of carp fry in the fry-collection nets and the destructive role played by predatory fish. Indian Journal of Fisheries, 4 (1), Pp. 47-61.
- Kisku, S., Chini, D.S., Bhattacharya, M., Kar, A., Parua, S., Das, B.K., Patra, B.C., 2017. A cross-sectional study on water quality in relation to fish diversity of Paschim Medinipur, West Bengal, India through geoinformatics approaches. The Egyptian Journal of Aquatic Research, 43 (4), Pp. 283-289.
- Kumbar, S.M., Lad, S.B., 2014. Diversity, threats and conservation of catfish fauna of the Krishna River, Sangli District, Maharashtra, India. Journal of Threatened Taxa, 6 (1), Pp. 5362-5367.
- Kundu, N., Mazumdar, D., Homechaudhuri, S., 2014. Seasonal changes in fish assemblages and trophic guilds in selected interconnected rivers in eastern India. Indian Journal of Fisheries, 61 (3).
- Mahapatra, B.K., Sarkar, U.K., Lakra, W.S., 2014. A Review on status, potentials, threats and challenges of the fish biodiversity of West Bengal. J. Biodivers. Biopros. Dev., 2 (140), Pp. 2376-0214.
- Raizada, S., Srivastava, P.P., Sahu, V., Yadav, K.C., Jena, J.K., 2015. Observations on captive breeding of the threatened freshwater shark Wallago attu (Bloch & Schneider, 1801). Indian Journal of Fisheries, 62 (4).
- Roberts, T.R., 1993. Artisanal fisheries and fish ecology below the great waterfalls of the Mekong River in southern Laos. Natural History Bulletin of the Siam Society, 41, Pp. 31-62.
- Sahoo, S.K., Giri, S.S., Sahu, A.K., Gupta, S.D., 2006. Effect of feeding and management on growth and survival of Wallago attu (Schneider) larvae during hatchery rearing. Ind. J. Fish, 53, Pp. 327-332.
- Talwar, P.K., Jhingran, A.G., 1991. Inland fishes of India and adjacent countries, 2 volumes. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 19, Pp. 1158.
- Thella, R., Dahanukar, N., Eldho, P., Ali, A., Raghavan, R., 2018. Population Dynamics of Wallago attu (Bloch and Schneider 1801) (Osteichthyes, Siluridae) in Three Small Rivers of Southern India. Asian fisheries Science, 31, Pp. 172-178.
- Tripathi, S.D., 1996. Present status of breeding and culture of catfishes in South Asia. Aquatic Living Resources, 9 (S1), Pp. 219-228.

