

## Effect of lower Jhelum hydroelectric power project on finfish diversity of river Jhelum, J & K.

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### ABSTRACT

Lower Jhelum Hydroelectric project under the programme of Uri hydroelectric power project Baramulla J & K, was commissioned three decades ago on River Jhelum. At this segment of river, 18 species of fishes have been recorded. After the commissioning of this project several deteriorative environmental effects have been noticed on the aquatic biodiversity of this river. This project exerted highly adverse effects on the population of mighty Mahaseer, *Tor putitora* (Golden Mahseer), which flourished a lot in the past but diminished so much so that it has come under endangered category of fish species. As such *Schizothorax plagiosomus*, *S. curvifrons*, *S. esocinus*, *S. labiatus* are also affected adversely and now are scarce in catches. Two major factors may be considered responsible for the dwindling population of above mentioned species of fishes first bunding of river and practically negligible provision of fish ways/fish ladders which has created obstacle in free movement of fishes for searching food and breeding grounds and secondly the alterations in the ecological feature of the region.

**Key words:** Finfish diversity of river Jhelum, Jhelum hydroelectric power project.

### INTRODUCTION

River Jhelum is called lifeline of Kashmir, and is the only source of water, which passes throughout the valley from south to north. This water body is used for irrigation, domestic purpose and for the production of hydroelectricity. About 25% of total population of Kashmir depends on this ultimate source as they consume and earn their living from fish fauna and other resources of this water body. This river system drains into famous lakes of Kashmir namely Wular Lake and Dal Lake which inhibit all the fish species of Kashmir.

The history of fishes dates back to Heckel (1938) and the study on biodiversity of ichthyofauna in the region is still continuing (Arjmund 2006, Qureshi *et al.* 2006). But due to the construction of hydroelectric power projects, its habitats are deteriorating at a very fast speed. Hora (1940) and Nautiyal (2000) has discussed various threats to the survival of mahseer, a major cold water fish due to

the stress caused on the ecology and destruction of its feeding and spawning grounds as an impact of multipurpose river valley projects. Thus, these projects sure to lead to the depletion in fish diversity of the respective area. To understand such impacts caused by the Lower Jhelum Hydroelectric project on the finfishes of upper and lower stretches of river Jhelum, Jammu and Kashmir, the present study was undertaken.

### MATERIAL AND METHODS

Occurrence and abundance of various fish species available at the sampling sites were studied on daily basis. For this purpose the fish species available in the daily landing in the local fishermen's net were thoroughly scrutinized. Some fish specimens were also brought to the laboratory after fixing them in 5-10% formalin. To study the impact of Lower Jhelum Hydroelectric Power Project on the finfishes of this region two sites were selected. The sampling sites-1 was selected near the entering

**Table - 1: Showing the results of occurrence of different species of fishes at site I (Gantamulla)**

Family	Species	June 06	Jul 06	Aug. 06	Sep. 06	Oct. 06	Nov. 06
Cyprinidae	<i>Crossocheilus diplocheilus</i>	01	-	05	06	01	-
Cyprinidae	<i>Cyprinus carpio</i>	18	18	14	08	02	04
Cyprinidae	<i>Carassius carassius</i>	01	-	-	03	-	-
Cyprinidae	<i>Bangana diplostoma</i>	-	-	02	-	03	-
Cyprinidae	<i>Puntius conchonius</i>	08	-	14	03	-	02
Cyprinidae	<i>Schizothorax labiatus</i>	01	01	04	-	02	01
Cyprinidae	<i>Schizothorax plagiostomus</i>	-	-	03	02	01	-
Cyprinidae	<i>S. curvifrons</i>	-	-	02	06	-	01
Cyprinidae	<i>S. esocinus</i>	01	-	-	01	03	-
Cyprinidae	<i>S. niger</i>	-	-	-	-	-	-
Cyprinidae	<i>S. sp.</i>	01	-	08	-	-	02
Cyprinidae	<i>S. juv.</i>	-	-	-	-	-	-
Total Number of Schizothorax		03	01	17	09	06	04
Cobitidae	<i>Botia birdie</i>	02	03	02	08	01	03
Balitoridae	<i>Triplophysa sp.</i>	-	02	-	01	-	02
Balitoridae	<i>Schistura sp.</i>	01	-	03	02	01	-
Sisoridae	<i>Glyptosternon reticulatum</i>	-	-	-	03	-	-
Sisoridae	<i>Glyptothorax kashmiriensis</i>	02	01	-	-	-	-
Sisoridae	<i>Glyptothorax pectinopterus</i>	-	-	-	-	-	-
Sisoridae	<i>Glyptothorax sp.</i>	-	-	-	01	-	-
Poecilidae	<i>Gambusia holbrooki</i>	02	08	02	08	04	03

**Table - 2: Showing the results of occurrence of different species of fishes at site II (Chahal)**

Family	Species	June 06	Jul 06	Aug. 06	Sep. 06	Oct. 06	Nov. 06
Cyprinidae	<i>Crossocheilus diplocheilus</i>	-	02	-	04	-	-
Cyprinidae	<i>Cyprinus carpio</i>	08	06	05	14	02	08
Cyprinidae	<i>Carassius carassius</i>	02	-	04	03	-	-
Cyprinidae	<i>Bangana diplostoma</i>	-	-	-	-	01	-
Cyprinidae	<i>Puntius conchonius</i>	-	03	-	08	-	04
Cyprinidae	<i>Schizothorax labiatus</i>	02	-	01	-	-	01
Cyprinidae	<i>Schizothorax plagiostomus</i>	-	03	02	02	02	-
Cyprinidae	<i>S. curvifrons</i>	01	01	-	01	-	-
Cyprinidae	<i>S. esocinus</i>	-	04	-	-	02	03
Cyprinidae	<i>S. niger</i>	-	-	-	-	-	-
Cyprinidae	<i>S. sp.</i>	-	-	02	-	-	-
Cyprinidae	<i>S. juv.</i>	-	-	-	-	-	-
Total Number of Schizothorax		03	08	05	03	04	04
Cobitidae	<i>Botia birdie</i>	-	02	-	02	-	-
Balitoridae	<i>Triplophysa sp.</i>	04	-	02	05	-	-
Balitoridae	<i>Schistura sp.</i>	02	02	04	-	-	-
Sisoridae	<i>Glyptosternon reticulatum</i>	01	-	03	02	01	-
Sisoridae	<i>Glyptothorax kashmiriensis</i>	02	-	01	01	-	04
Sisoridae	<i>Glyptothorax pectinopterus</i>	-	-	02	01	-	-
Sisoridae	<i>Glyptothorax sp.</i>	-	-	-	-	-	-
Poecilidae	<i>Gambusia holbrooki</i>	12	04	04	08	05	10

point of Lower Jhelum Hydroelectric Power Project at Gantamulla and Site- 2 near the outlet of Lower Jhelum Hydroelectric Power Project at Chahal.

## RESULTS AND DISCUSSION

Lower Jhelum hydroelectric project, under the programme of Uri hydroelectric power project Baramulla J & K, was commissioned three decades ago on River Jhelum. At this segment of river, 18 species of fishes belonging to 12 genera have been recorded which are mentioned in table 1. After the commissioning of this project several deteriorative environmental effects have been noticed on the aquatic biodiversity of this river. This project exerted highly adverse effects on the population of mighty Mahseer, *Tor putitora* (Golden Mahaseer), which flourished a lot in the past but diminished so much so that it has come under endangered category of fish species. As such *Schizothorax plagiostomus*, *S. curvifrons*, *S. esocinus*, *S. labiatus* are also affected adversely and now are scarce in catches. Table 1 and 2 given below show the fish catches at two different sites.

The present study throws light on the impact of Lower Jhelum Hydroelectric Power Project which has caused depletion in the fish diversity of

lower stretches of river Jhelum. It has been observed that, this project exerted high adverse effects on the population of mighty Mahseer, *Tor putitora* (Golden Mahaseer), which flourished a lot in the past but diminished so much that it has come under endangered category of fish species. As such *Schizothorax plagiostomus*, *S. curvifrons*, *S. esocinus*, *S. labiatus* are also affected adversely and now are scarce in catches. A number of scientists have opined that one of the aspect of environmental degradation is the altered ecology and destruction of both the feeding and spawning habitat due to the multipurpose river valley projects (Johal and Tandon, 1983; Shreshta 1986; Shegal 1988; Nautiyal and Singh 1989; Dubey 1989; Nautiyal 2000.). Nautiyal and Singh (1989) projected the bleak future of Himalayan mahseer in Gharwal region where 24 river valley projects are proposed including the commissioned Chila Hydroelectric Project in foothills. The present study also alerts on two major factors which are considered responsible for the dwindling population of above mentioned species of fishes firstly, the bunding of river and practically negligible provision of fish ways \ fish ladders which has created obstacle in free movement of fishes for searching food and breeding grounds and secondly, the alterations in the ecological feature of the region.

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