AgriCos e-Newsletter
ISSN: 2582-7049
Volume: 02 Issue: 09 September 2021 Article No: 07

Sustainable Fisheries in Bhima River of Maharashtra: Status and Measures

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SUMMARY

Fishing is one of the key livelihood activities alongside the major rivers. Many families are engaged in fish harvesting and marketing that also provides them cheap source of protein and nutrition. But increasing human population and anthropogenic activities in river basins have negatively impacted the rivers as well as the life under water. Through this article authors try to highlight the plight of Bhima river and also suggest measures for improving the riverine ecosystem. Ultimately, efforts are needed to promote sustainable fishing in Bhima river.

INTRODUCTION

The Bhima River is a one of the major rivers in South India. With so many smaller rivers as tributaries, it flows southeast for 861 kilometers long journey. The river originates in Bhimashankar hills on western side of Sahyadri ranges in Pune district of Maharashtra, at 19°04′03″N 073°33′00″E. The multi-purpose Ujjani dam (also called as Bhima dam), one of the major reservoirs with water spread area of nearly 29,000 ha, is located on Bhima river. Approximately, 712 tons of fish is annually harvested from this dam out of which 19 percent catch consists major carps' species (Wikipedia, 2021). All over the Bhima river basin, large number of fishers catch fishes throughout the year by means of different fishing methods. However, most of the fish is harvested by using gill nets which are left in the water overnight and collected early in the morning. At some location small scale fishing is also practiced using fishing rods.

Figure 1. The map of Maharashtra state showing Bhima river basin.

Fish diversity in Bhima River

Literature and first-hand observations clearly indicate that Bhima river was rich in diversity of aquatic species including fish (Shendge and Pawar 2014; Dede and Deshmukh 2015). About 26 fish species are reported from Bhima River. The major fish found in river are Ghogrya (*Siluridae Eutropiichthys*), Wanz (*Ompok binotasus*), Valshivada (*Wallago attu*), Shingtya (*Mystus seengtee*), Fossil Cat (*Heteropneustes fossilis*), Chalat (*Ompok pabo*), Khavalchor (*Puntius dorsalis*), Cyprinus (*Cyprinus Carpio*), Rav / Rohu (*Labeo rohita*), Gavtya (*Ctenopharyngodon idella*), Kanashi (*Labeo Kalbasu*), Mrigal (*Cirrhinus mrigala*), Catla (*Catla catla*), Chandera (*Hypophthalmichthys molitrix*), Kolashi (*Puntius kolus*), Ray fin (*Osteobrama alfredianus*), Pool barb (*Puntius sophore*), Maral (*Channa marulius*), Tilapia (*Oreochromis mossambicus*), Dokarya (*Channa orientalis*), Kala masa (*Channa punctatus*), Knife fish (*Notopterus*), X-Ray Fish (*Parambassis ranga*), Mangur (*Clarias batrachus*), Amazon Sailfin Catfish (*Pterygoplichthys pardalis*), etc.

Ecological damage to Bhima river ecosystem

Increasing pollution from multiple sources in Bhima River has destroyed number of fish habitats over the years and created highly unfavorable conditions for survival of aquatic life and diversity. Bhima river flows through an industrial settlement as well as urban areas and hence pollutants from the industrial waste are contaminating the river water (Shukla *et al*. 2020). Massive volumes of urban sewage and inadequately treated industrial waste water from Pimpri-Chinchwad-Chakan-Pune industrial-urban cluster that gets released into the river are primary reasons for deterioration of water quality and the subsequent loss of fish diversity in the river. Over the years, native fish fauna declined due to the impact of urbanization, industrialization, intensive fish harvesting for subsistence and sport/ recreational activities and introduction of exotic species. Development of the cities on the bank of river resulted in the habitat loss for fish and posed an ecological threat to the aquatic ecosystem of Bhima river (Garg 2012). In addition, in recent years Bhima basin has been exposed to excessive pressure of anthropogenic activities such as religious festivals enticing millions of pilgrims through the year. These activities are adversely affecting river's health and its water availability. Besides, illegal encroachments, over exploitation of small sized non-economical fishes, intensive growth of unwanted weeds, unavailability of native fish seeds, poor education and socio-economic condition of the fisherfolk, involvement of middlemen, lack of data of fish catch/prices were said to be threatening riverine fish catch (Goel 2006). Therefore, the authors suggest following remedial measures to promote sustainable fishing and ecological conservation in Bhima river.

Key measures to promote sustainable fishing in Bhima River

- Treatment of the industrial and domestic sewage water before the disposal in river. Treatment and proper disposal of industrial and urban solid wastes. Pollutants that cause death of fish fauna due to depletion of oxygen in water should be stopped by stricter enforcement of laws that are in place.
- Enlisting both governmental and non-governmental organizations (with public participation) to restore the water quality and to conserve precious fish diversity of the Bhima river.
- Regular controlling of unwanted weeds in river using both manual and eco-friendly methods with community participation to improve water quality.
- Implementation of conservation oriented rules and regulations in participation with local fishers and other stakeholders for effective riverine water resource management
- Effective monitoring and control of destructive fishing practices namely captures of juveniles and spawn, brooders, use of dynamites and poison, small mesh size nets or mosquito nets, etc. Establish fish sanctuaries along the select stretches of the river so that fishes have a chance to breed and grow at least in specific designated habitats.
- Strengthening of fisheries cooperatives, providing marketing support, continuous education and empowerment of fishers would lead to scientific and sustainable fishing practices
- Effective implementation of development and social welfare schemes among fishers. Better socio-economic conditions will discourage fishers from destructive fishing practices.
- Promoting fish ponds on the bank of river by farm owners can increase fish production as well as provide additional source of income.

- Scientific and regular stocking of fish seed (Indian Major Carps) in Ujjani and other reservoirs in Bhima river basin would improve the status of commercial fisheries.
- Proper data of fish species availability and catch are not available. Hence, systematic data shall be collected at periodic intervals on fish species, catch, water quality and environmental parameters to aid in better policy for sustainable development.

CONCLUSION

Livelihoods for thousands of poor fisher families, and the public in general, depend on the sustainable future of the Bhima river ecosystem. It is our joint responsibility to promote good fishing practices for sustainable fishing in Bhima river. There is a massive need to check the pollution in Bhima river and to implement necessary measures to protect the aquatic riverine ecosystem. The community participation for social policing across river basin to check illegal exploitation of riverine resources and for eradication of harmful riverine weeds holds the key for ensuring sustainability of fishing and fishers livelihoods in Bhima river basin.

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