

An assessment of fish vulnerability in Mahakali, Karnali and Rapti River Basins of Western Nepal

BACKGROUND AND STUDY OBJECTIVES

Freshwater biodiversity resources, with their existence and intrinsic values, provide a wide range of essential goods and services for the sustenance and/or existence of human as well as ecological communities. A thorough knowledge database on ecological and ichthyofaunal variability is required to develop and implement conservation initiatives that ensure the sustainable management of aquatic biodiversity. A huge knowledge gap persists on capture fishery and associated threats, especially in the Mahakali, Karnali, and Rapti River Basins of Western Nepal. The creation of a detailed fishery database requires sufficient time and resources, whereas Paani's rapid assessment was conducted based on local knowledge on aquatic biodiversity and associated threats in these river basins, with an aim of creating an inventory of fish biodiversity, conservation value areas, fishing hot spots in river stretches, and associated threats. The exploratory research created baseline data on aquatic biodiversity and their threats to inform policy and programs for implementation at different level of governments, and for use in future systemic research.

The specific study objectives were:

- Prepare inventory of fish diversity with keystone and endemic fish species across nine Paani's priority watersheds of three river basins.
- Locate and map stretches or sections of the Rivers with respect to fish breeding, nursing as well as high fishing areas in main rivers, tributaries and streams,
- Identify priority factors posing threats to fish biodiversity in stretches of main rivers & their tributaries.

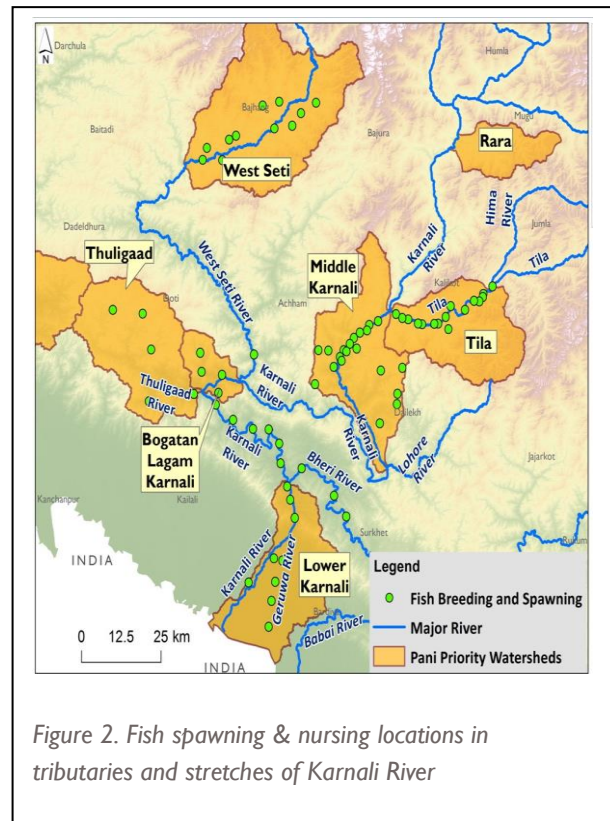
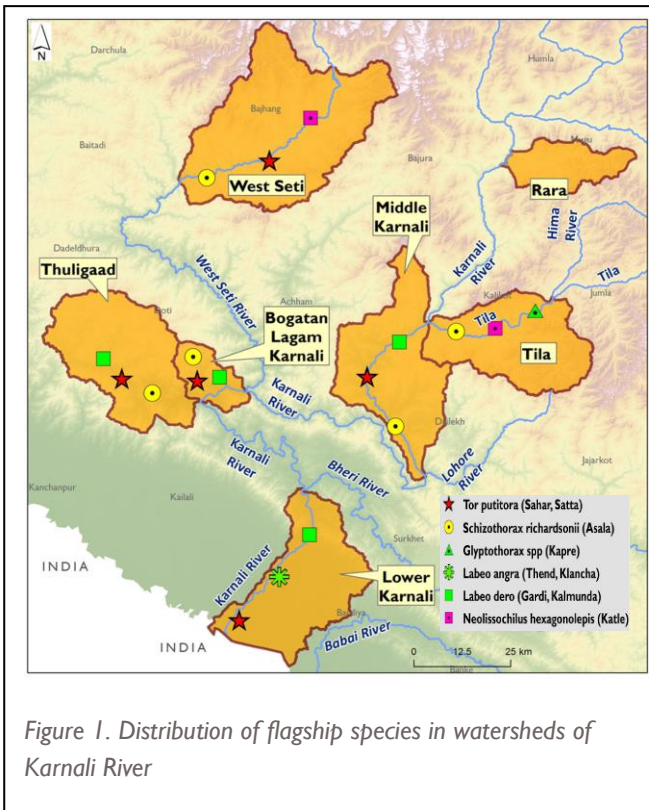
KEY FINDINGS

- 124 freshwater fish species were inventoried, with the most in Lower Karnali (102) and the fewest in West Seti (13). This diversity includes both migratory and resident fish species.
- Six flagship species of high biodiversity and economic value, and seven endemic species were identified (Figure 1).
- Identified the role of migratory fish species [Tor spp, Bagarius spp and Anguilla bengalensis] and flagship species in maintaining ecosystem integrity in river systems.
- River stretches for breeding (125) and foraging habitats (142) were mapped (Figure 2).
- A total of 176 fishing hotspots were identified in nine watersheds across the three river basins (Figure 3).
- Major threats identified include destructive fishing practices, overfishing (too many people, unregulated fishing implements), and over-extraction of river resources.
- Climate-induced hazards, such as flood and river turbidity, were reported to be affecting fish stocks.

The role of migratory and flagship fish species as perceived by community:

- Indicate the presence of other fish and other aquatic organisms in the river and tributary (maintenance of trophic order)
- Link the upstream and downstream ecosystem.
- Inform the hydrological and thermal dynamics of river,
- Support for subsistence livelihood.

- Identified the types and implications of fishing implements per community experience for each of the study watersheds.



ACTION / RECOMMENDATIONS

- The study provided a better understanding of the fish biodiversity, potential high conservation value areas, and existing problems for fish biodiversity conservation. The information can be used to develop tailored conservation plans and programs.
- Integration of this body of knowledge on aquatic biodiversity is important to raise sense of ownership of conservation initiatives among local communities. The results of the study should be used to initiate participatory conservation governance.
- The study generated a large volume of qualitative information, which needs to be validated by systematic research. Exploratory (community perceived) and academic research should be carried out to enrich and strengthen the scientific knowledge of aquatic biodiversity, and to inform and develop conservation policies that enhance sustainable capture fisheries.
- A next step is to devise a strategy that reduces factors that threaten river health, freshwater biodiversity, and ecosystem services that support local livelihoods.
- This body of knowledge can inform a mechanism through which freshwater biodiversity is maintained in situ engaging key stakeholders mandated with rivers and water bodies.

