Field data collection to link river flow and ecological assets in the Koshi River Basin, Nepal

Sound basin planning requires a deep understanding of the relationship(s) between freshwater flow through river basins and the ecology supported by the flow. Yet this is a critical knowledge gap in many countries. The Himalayan region in Nepal, supports some of the highest biodiversity in the world and key water dependent ecological assets include (for example) the Ganga dolphin, Asiatic buffalo, Asian elephant, fish, macroinvertebrates, aquatic vegetation and birds.

A group of 12 Nepali ecologists undertook a review and reported the known links between river flow and ecology in the Koshi River Basin (Doody et al. 2016). The importance of understanding these relationships lies in understanding the ecological flow requirements that are required to maintain the integrity of ecosystems. The key benefit of understanding river flow-ecology relationships is that when river flow changes occur, information is available to support the development of environmental flow policies that recognize the need to protect (and possibly enhance) ecological components and multiple uses of the river(s) into the future.

The report confirmed that few flow-ecology relationships have been measured in Nepal. More information is thus required to influence the consideration of ecology in future development projects and water policy development related to current water reform in Nepal.

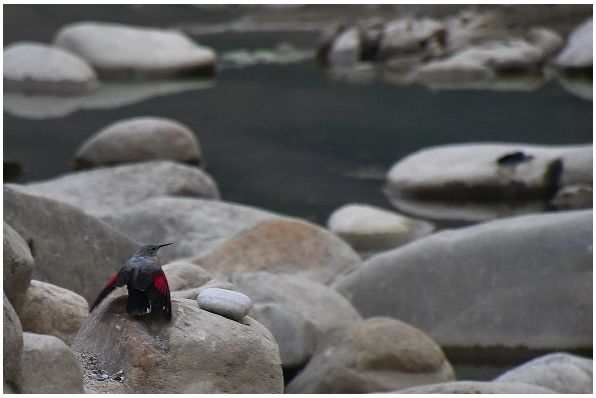
Nepal ecologists will supervise 3 Nepali Masters students to undertake field work to determine flow-ecology relationships by understanding the water requirements and therefore habitat requirements of the Ganga dolphin, macroinvertebrates, birds, and aquatic vegetation over 2018-2019. These environmental assets are thought to be some of the ecological indicator species of flow change in Nepal. Wetlands in and around the Koshi Tappu Wildlife Reserve have been selected as the study area. Field work (data collection) will be undertaken seasonally with a field visit once per season, beginning in July 2018. An additional PhD student is supported to investigate the links between Ganga Dolphin and flow (2016-2019).

Establishing the relationship between macrophytes and water level fluctuations in the wetlands of Koshi Tappu – Ms Tika Regmi (Masters, Tribhuvan University, Kathmandu)

Objective: to establish the relationship between aquatic macrophytes and water level fluctuations in wetlands of the Koshi Tappu region.

Specific Aims:

- To study seasonal changes in limnological parameters and macrophytes of wetlands;
- To quantify the relationship between hydrological parameters and macrophytes;
- To identify macrophytes that are sensitive to water level fluctuations.



Establishment of relationship between macroinvertebrates and changes in flow ecology in Koshi Tappy Wetlands – Ms Sunita Shretha (Masters, Tribhuvan University, Kathmandu)

Objective: Establish the relationship between macroinvertebrate and change in river flow in the Koshi Tappu wetland region.

Specific Aims:

- To assess seasonal change in composition and diversity of macroinvertebrates in the Koshi Tappu wetland region;
- To establish relationship between hydrological variables and ecological components (macroinvertebrates);
- To identify potential macroinvertebrates that are sensitive to change in limnological parameters.

Bird community dynamics in relation to water flow in Koshi Tappu Wildlife Reserve, Nepal - Mr Aditya Pal (Masters, Tribhuvan University, Kathmandu)

Objective: To understand the relationship between ecological flow and bird community structure in Koshi Tappu Wildlife Reserve, Nepal.

Specific Aims:

- To characterize habitat types;
- To explore water bird community structure;
- To assess the effect of river flow on bird communities in the Koshi Tappu Wildlife Reserve.

Conservation of freshwater rivers of Nepal: Endangered river dolphins as indicators of river system health – Mr Shambhu Paudel (University of Arizona)

Objective: improve scientific knowledge on Ganges river dolphins to inform management and conservation effort for this endangered species

Specific Aims:

- How can survey techniques to provide robust estimates of abundance for Ganges river dolphin in Nepalese river systems be improved?
- How do underwater behaviours and diel activity patterns of Ganges river dolphins change spatially and temporarily?
- How do artisanal fishing communities affect the habitat use of Ganges river dolphins?
- Is currently available natural water flow (discharge) sufficient to conserve Ganges river dolphins in Nepalese waterways during the low water season?
- Is there a taxonomic and phylogenic relationship between isolated groups of Ganges River dolphins?

Student Supervisors

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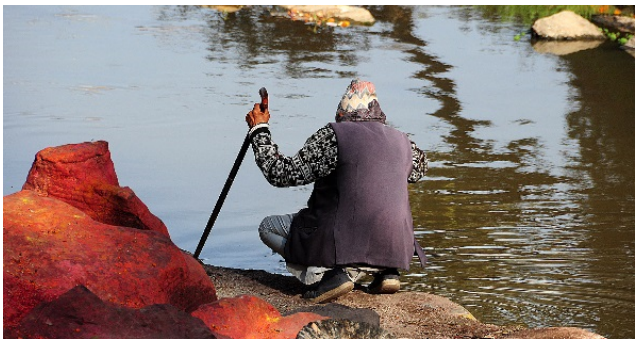
Nepal project management: Himalayan Nature (हिमाली प्रकृति) Himalayan Conservation & Research Institute



References

TM Doody, SM Cuddy, Bhatta LD (Eds). 2016. Connecting flow and ecology in Nepal: current state of knowledge for the Koshi Basin. Sustainable Development Investment Portfolio (SDIP) project.

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ACKNOWLEDGEMENTS

This fact sheet designed and implemented by CSIRO contributes to the South Asia Sustainable Development Investment Portfolio and is supported by the Australian aid program. We acknowledge the financial and logistical support of the Australian High Commission in Dhaka.

V1, October 2018. This fact sheet can be downloaded from https://research.csiro.au/sdip