

Project Update: August 2022

Following the end of the first phase data, the following activities were conducted from January 2022 up to now:

- We have purchased the fishing gear for fish sampling (monofilament and multifilament nets with 6 and 8 cm mesh size) and chemicals for analysis of water quality (nutrient palintet tablets).
- All sampling sites for measuring water quality and fish sampling were identified and selected based on different anthropogenic pressures.
- From all sampling sites, the physical characteristics of the Megech River shoreline and riverbed coverage were characterised.
- The river's water quality parameters (physicochemical properties) were measured at the Megech River and its upstream tributaries to determine water pollution status.
- Important spawning routes of migratory *Labeobarbus* species were detected in the irrigation dam of the Megech River.
- A total of 1150 specimens were collected from all sampling sites of Megech and its tributaries. A total of 11 *Labeobarbus* species and two other species (*O. niloticus* and *C. gariepinus*) were identified from the total collected specimens. The dominating species were *Labeobarbus nedgia*, *Labeobarbus intermedius*, *Labeobarbus beso*, and *Labeobarbus brevicephalus*. Other specimens that were found rarely include *Labeobarbus tsanensis*, *Labeobarbus crassibarbus*, *Labeobarbus degeni*, *Labeobarbus megastoma*, *Labeobarbus trutiformis*, *Labeobarbus platydorsus* and *Labeobarbus gorgorensis*. One new (unidentified) *Labeobarbus* form was found in the upstream sampling site of Megech River. It might be due to the presence of hybridisation.
- Some biological parameters of the collected specimens were measured, including gonad weight, sex, total length and total weight, whereas some of the collected specimens were released into the river after immediate species identification.
- Data on the effect of the newly constructed irrigation dam on the upstream migration of *Labeobarbus* species was collected (fish distribution and abundance), although the data are not analysed yet. We identified the Megech River morphology status, which is highly damaged due to intensive sand extraction, river water flow disconnected by constructed dam and mining of sand and gravel.

Some pictures showing the activities are presented as follows:



Damaging of Megech River shoreline and river channel due to intensive sand mining at below the irrigation dam of Megech River, which is being constructed. Sand excavation leads to increase turbidity and removal of important gravel beds (right).



Sample of collected *Labeobarbus* species at Megech River below irrigation dam site.



Megech river upstream site during post rainy (Left) and rainy season (Right)



Fish sampling in the upstream site of Megech River above irrigation dam (July 2022; rainy season)



A constructed temporary dam cuts the river flow during dry season (left). The newly unidentified specimen seems like a hybrid between *Labeobarbus beso* and *Labeobarbus intermedius* (right).



Angereb River which is one of the polluted tributaries of Megech River. Upstream tributary of Megech flow across Gondar City (Qeha, Angereb, Shinita, Dimaza rivers).



Fishing, species identification, length-weight, gonad and maturity stage measurements



Laboratory analysis of water nutrients at University of Gondar laboratory.

Although I have not yet analysed the spatiotemporal dynamics of the threatened *Labeobarbus* species, the data and also field observations indicated how the riverine environment is degraded and affects the fish spawning grounds, in particular how migratory species are more vulnerable in relation to the construction of irrigation dams and water pollution. The findings help to identify the suitable spawning grounds for further in-situ conservation and alternative mitigation measures to conserve the threatened species sustainably.

Remaining activities

- Data collection of fish and water will continue up to December 2022.
- Land use land cover change of the study sites.
- Identify the most vulnerable migratory *Labeobarbus* species and the status of their spawning routes.
- Identify the potential pollution sites and anthropogenic factors.
- Manuscript preparation and publications.
- Proposed conservation plans or strategies based on the finding of the current studies for further investigation and conservation activities.