



## **Conceptualizing an IWRM for Mongolia's Kharaa River Basin: The Environmental Science Basis**

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Like its central Asian neighbors, highly continental Mongolia is not only a water-scarce but also a data-scarce country (Malsy et al. 2013; Cyffka & Karthe 2013). At the same time, regional effects of global climate change, major land use changes, a booming mining sector and growing cities with insufficient and decaying water and wastewater infrastructures result in an increasingly unsustainable exploitation and contamination of ground and surface water resources putting at risk both aquatic ecosystems (Hofmann et al. 2010) and human health (Karthe et al. 2012).

In the context of a research and development project aiming at the implementation of an Integrated Water Resources Management, we have selected the mesoscale (15.000 km<sup>2</sup>) basin of the Kharaa River as a model region for Mongolia. Due to the scarcity of environmental data, one important prerequisite for the conceptualization of an IWRM was an integrative assessment of water availability, water quality and the ecological state of aquatic ecosystems. While global climate change is not expected to cause a decline in precipitation, deforestation in headwater areas and a rising water consumption for irrigation are likely to have adverse effects (Karthe et al. 2013). In surface water bodies and some ground water sources, elevated levels of nutrients and heavy metals could be observed. Due to anthropogenic activities, arsenic concentrations exceed both natural background levels and maximum permissible limits for drinking water in several locations (Hofmann et al. 2010; Pfeiffer et al. 2014). In the river system, high fine sediment loads impair the habitats of the macrozoobenthos. The principal cause for this is overgrazing in the floodplains and resultant riverbank erosion (Hartwig et al. 2012; Theuring et al 2013). Moreover, macroinvertebrate communities were found to be affected by land use intensity and mining activities (Schäffer et al. 2008; Avlyush 2011). As compared to other nearby rivers, which are home to a diverse fish fauna including three red-listed salmonid species, the Kharaa is comparatively more impacted by landuse and recreational fishing (Krätz 2009; Kaus 2011).

Based on these environmental assessments and an indepth analysis of water governance structures at the national, regional and local levels, a River Basin Management Plan for the Kharaa is now under preparation.