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Developing a Science-based River Basin Management Plan for the Kharaa River Basin, Mongolia

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The Kharaa River Basin (KRB), which is located north of Mongolia's capital Ulaanbaatar and south of Lake Baikal, was chosen as a model region for the development and implementation of an integrated water resources management consisting of a monitoring concept, technical measures and a capacity development program (Karthe et al. 2012a).

The basin of the Kharaa River covers an area of 14534 km^2 that is partly mountaineous and largely covered by taiga and steppe. At its outlet, the 362 km Kharaa River has a mean long-term annual discharge of 12.1 m^3/s (MoMo Consortium 2009). A highly continental climate results in limited water resources, and rising water consumption coupled with the effects of climate and land use change may in the future exacerbate this water scarcity (Malsy et al. 2012; Karthe et al. 2013). Whereas the environment in the upper part of the catchment is in a relatively pristine state, the mid- and downstream sections of the river are characterized by nearby industry, mining activities and intensive agriculture (Menzel et al. 2011), resulting in declining water quality and ultimately a degradation of aquatic ecosystems (Hofmann et al. 2010; Hartwig et al. 2012). Moreover, it is a problem for the supply of major cities like Darkhan which largely rely on alluvial aquifers containing shallow-depth groundwater (Mun et al. 2008). Currently, there are alarming signs of water quality deterioration. With regard to water provision, a major problem is the poor state of distribution infrastructures which were often built in the 1960s and 70s (Scharaw & Westerhoff 2011). Rather little is currently known about the water quality supplied to end users; the latter is even more dubious in the city's informal ger districts (Karthe et al. 2012b).

One important goal of the research and development project "Integrated Water Resources Management in Central Asia: Model Region Mongolia" lies in the implementation of a holistic concept for water resources monitoring and management. In the past, shared and unclear responsibilities, a spatial mismatch between administrative and river basin boundaries, the lack of relevant information, financial resources and implementation capacity resulted in an uncoordinated and partially uncontrolled exploitation of water resources (Livingstone et al. 2009; Horlemann et al. 2012). The recent decision of the Mongolian government to develop river basin management plans and to provide for their implementation through river basin councils and administrations, and the comparatively good data availability resulting from the R&D project, resulted in the decision to jointly develop a science-based river basin management plan for the KRB as a model region for other river basins of the country.

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