

## **Groundwater development in Fergana Valley: the adaptation strategy for changed water management in Syrdarya basin**

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**Abstract** During the last decade, the competition for water between the hydropower-oriented upstream and irrigated agriculture-centred downstream in the Syrdarya River basin, Central Asia, has significantly increased. Since 1993, 2–3 km<sup>3</sup> of winter flows from hydropower generation in the upstream have flowed annually into the saline depression of Arnasai located in the midstream. This results in much less water being available for irrigation during summer. Groundwater development modelling conducted for one of the Fergana Valley's aquifers suggests that temporary storage of winter flows in the aquifer – “water banking” – could be an effective adaptive strategy to optimize water management in the basin. The study concludes that a shift from canal to groundwater irrigation, combined with winter-flow banking can effectively reduce the upstream–downstream pressures and ensure improved water supply for downstream water uses during summer time.

**Key words** groundwater development; artificial recharge; river basin management; Syrdarya River, Central Asia