



Federal Ministry
of Food
and Agriculture

PHD PROGRAM OF BMEL

ZayandehLife: Implementing Technical and Institutional Measures for Improving Agriculture Water Use Efficiency in the Zayandeh–Rud River Basin

country/countries	Iran
funding agency	Federal Ministry of Food and Agriculture – BMEL
project management	Federal Office for Agriculture and Food – BLE
project coordinator	Leibniz Institute for Agricultural Engineering and Bioeconomy
project partner(s)	Isfahan University of Technology, Iran
project budget	101.152,17 €

project duration	50 Months
key words	Water governance; Demand-side management; Water conflicts; Institutional arrangements; Zayandeh-Rud River Basin
background	<p>While fresh water supplies are limited with little or no new sources, water demand is not properly managed especially in agriculture, where high amount of water consumption is used for irrigation. Because of this, water demand management in agricultural sector is expected to play a vital role in coping with water scarcity and is essential in achieving the Sustainable Development Goals (SDGs). Major structural transformations are needed for enabling a paradigm shift from “supply-side” water management towards “demand-side” policies and management strategies according to what is hydrologically, economically, socially, and politically possible to cope with water scarce conditions. The formulation of principles associated with successful collective action in water governance is a challenging endeavor that needs to be addressed. The Zayandeh-Rud basin is selected as the study area of research where the competition for limited surface water resources is reached to a critical level. The Zayandeh-Rud river basin is located in central part of Iran with more than four million inhabitants and one million people depending on irrigated agricultural production.</p>
objective	<p>This study aims to explore the challenges and opportunities for a paradigm shift from supply-side to demand-side management of water resources in agriculture, and to find principles that provide a basis for deriving of technical and institutional strategies to reduce water demand in agriculture. A mixed-methods approach will be used to better understand the intricate development of institutions and governance structures for decreasing water demand in agriculture sector.</p>

results

The ZayandehLife project has yielded significant results that contribute to our understanding of water management in the Zayandeh–Rud river basin and provide valuable insights for addressing water scarcity and water conflicts in the basin.

Through a comprehensive and integrated approach, the project has generated a wealth of knowledge on stakeholder analysis, power relations, and institutional arrangements within the water governance system. The findings have highlighted the complexities and interdependencies among various actors, shedding light on the challenges and opportunities for sustainable water management. The project's recommendations for stakeholder engagement, policy reforms, and knowledge sharing have the potential to guide decision-making processes, foster collaboration, and promote the adoption of effective water management strategies in the basin.

Furthermore, the project has emphasized the importance of demand-side management approaches and the adoption of innovative technologies and practices to enhance water use efficiency in agriculture. The project's results have provided evidence-based insights into the socio-economic and environmental aspects of water management, informing policy recommendations for improved water allocation, stakeholder participation, and institutional reforms. Overall, the project's findings contribute to the broader knowledge base on sustainable water management and have practical relevance for addressing water scarcity and promoting the long-term sustainability of the Zayandeh–Rud river basin.

recommendations

Transitioning to sustainable management of agricultural water demand in the Zayandeh–Rud River Basin is crucial for addressing water scarcity and achieving sustainable development. The project's findings provide valuable insights into water governance dynamics, stakeholder relations, and interdependencies. Based on these insights, several recommendations emerge. Stakeholder engagement should be promoted by involving actors from diverse sectors, conducting stakeholder and social network analyses, and fostering effective collaboration. Institutional arrangements should be strengthened through revising water allocation mechanisms, enhancing stakeholder participation, and aligning policies with demand–side management principles. Knowledge sharing and capacity building efforts should be enhanced through workshops, presentations, and training programs, promoting evidence–based decision–making among water managers and policymakers. Collaboration and conflict resolution mechanisms should be established to foster dialogue and cooperation among diverse actors, utilizing platforms for stakeholder engagement and inclusive decision–making practices.

Additionally, prioritizing water-saving practices and technologies, such as precision irrigation and climate-resilient agricultural techniques, is crucial. This can be supported through financial incentives, technical assistance, and farmer training programs. Advocating for policy reforms that prioritize sustainable water use and support demand-side management approaches is essential, including integrating water-saving practices into agricultural policies, allocating sufficient resources for water demand management, and incentivizing the adoption of water-efficient technologies. Implementing water allocation mechanisms that prioritize equitable distribution among sectors and users, considering both agricultural and non-agricultural water demands, is vital. Developing strategies for climate change adaptation, including vulnerability assessments, resilient infrastructure, and water storage during drought periods, will enhance the basin's resilience. Restoring and protecting ecosystems through measures like reforestation, wetland conservation, and sustainable land management practices will improve water infiltration and quality. Strengthening monitoring and data management systems is essential for informed decision-making, and international cooperation and knowledge exchange can provide valuable experiences and best practices for addressing water challenges. Implementing these recommendations will pave the way for sustainable agricultural water demand management and foster a resilient water governance system in the Zayandeh-Rud River Basin.

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