

Capacity Development

Based on the team's experience and lessons learned over many years in various parts of the world, we have developed our own successful approach towards capacity development.

The overall objective is to link the more concrete or explicit aspects of capacity development such as training, institutional strengthening, and adapting the legal system with local or tacit knowledge and aspects of ownership. The approach is based on three integrated elements: research, education, and advisory services.

Selected Project Activities

In the **Netherlands**, nutrient loads from agricultural land on the surface water system are far too high in many areas. Impressive results were achieved by carrying out model studies and field research to define the cost effectiveness of hydrological measures, buffer-strips and use of artificial wetlands.

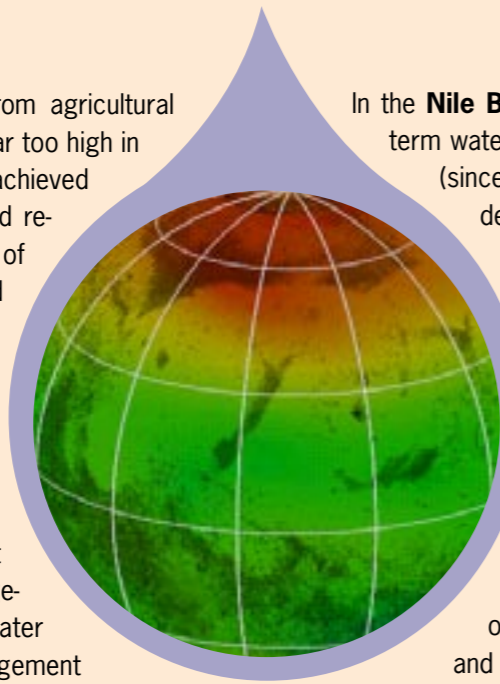
Contributing to the **European research area** we are leading numerous specific research projects and large integrated projects. Here we address some of the most prominent present and future challenges of water management, leading to a better insight into water stress mitigation and adaptive management options.

In **South Asia**, our team has been involved since the 1980s in operational research into integrated water resources management in various states of India and the various provinces of Pakistan. As one of the world's major irrigating areas, these national and state/provincial governments currently face huge challenges in water management: transboundary water disputes on reservoir releases of major rivers, inequity in canal water distribution in irrigation commands, over-exploitation of groundwater resources, and shortages in the drinking water supply for large cities.

In the **Nile Basin**, our team is responsible for the long-term water partnership with the Egyptian Government (since 1976), supporting it with various activities, developing water policy and creating strategic planning. In our EU research in the Nile region, we are working towards the development of the scientific base for IWRM on a regional scale, including research on dealing with conflicts and possible trade-offs between water allocation for food for energy and for ecosystems.

In **South-East Asia**, our team and cooperative partners have initiated a number of projects in the field of research, education and application. The aim is to promote the wise use of tropical peatlands by integrating biophysical, hydrological and socio-economic data within strategies for sustainable management and development.

Cooperation with **Central Asia** dates back to a long history of ILRI activities. Current projects focus in particular on supporting the ECO-GIS centre in Tashkent, the collaborative education and training of young scientists, the revision of water management practices in irrigation areas, and the assessment of the impact of climate change on the Amu Darya basin.



Integrated Water Resources Management

Centre for Water and Climate (CWK)

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ALTERRA

WAGENINGEN UR

Justification

Water is a vital need for life, nature, and the development of civilizations. Humanity will move towards peace and development, if it also ensures access to safe water resources and food for the people of this planet.

At the same time, nature, ecosystems, and bio-diversity are essential to decrease vulnerability to extreme hydrological events.

The Alterra-IWRM team belongs to the Centre for Water and Climate (CWK) of Alterra, the prime research institution on Environmental Sciences in The Netherlands. Alterra is part of Wageningen University and Research Centre. The Alterra-IWRM team incorporates the Alterra-ILRI [formerly International Institute for Land Reclamation and Improvement (ILRI)] activities and will further develop the rich ILRI knowledge heritage to improve our services to people the world over.

Mission statement

To lead the development and provision of knowledge, tools, and measures for supporting the sustainable management of land and water resources without compromising the sustainability of vital ecosystems and human communities



Our approach

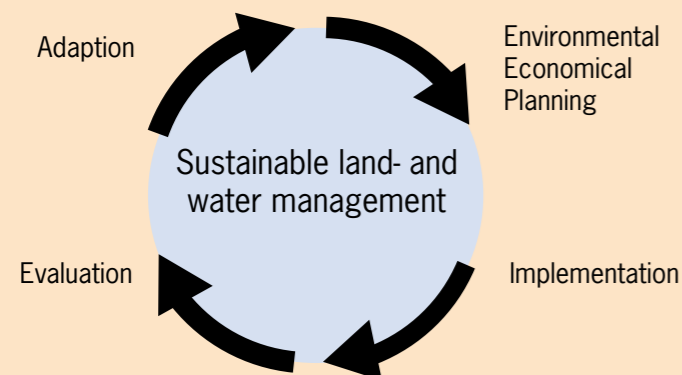
Our research is characterized by the 'Wageningen approach' of developing practical and implementable solutions for complex water related problems. Following the IWRM process cycle, we do this by combining different disciplines in the natural and social disciplines together with elements of research, education and advisory services.

Our specialty includes:

- To extend past experience in irrigation and drainage further towards the development of sustainable agricultural practices, including emissions of pollution and other qualitative aspects of water use.

- To integrate the protection of natural areas and the use of near natural measures to reduce pollution emissions and to decrease the vulnerability in terms of water stress, both for shortages and excess of water
- To use the interaction of land and water systems at catchment scale as a key element aiming at rational use of limited water resources, building up prevention measures against extreme hydrological events, and securing bio-diversity

Processmode IWRM



Knowledge brokerage

In The Netherlands, ever since the Middle Ages, there has been a continuous creation of new land for agriculture, and adjustment of the hydrological system to meet new and increasing demands. In the last decades, Dutch water management has gradually changed towards a focus on water management strategies based on multiple land use planning. Supporting the knowledge brokerage from and to the Netherlands, critical research topics and reasons to improve our approach are continuously revised

50 years of experience with adapting Dutch know-how for addressing irrigation and drainage elsewhere



Providing new research demands, testing of tools under extreme hydrological conditions

Our core expertise

Catchment Hydrology

To develop, apply and exchange knowledge of hydrological processes and patterns at a catchment scale.

To match water demands and water supply, we provide the catchments' water manager with knowledge concerning processes and properties of the hydrological system, using modern techniques such as GIS-based analysis and Remote Sensing. The focus is on processes at the land surface, the unsaturated zone and on the interaction with the drainage system.

Water quality

To develop knowledge on applicable pollution control measures, and to integrate this in knowledge on ecosystems.

Nowadays most water quantity issues have a water quality aspect such as high concentrations of salts, pesticides, heavy metals and/or nutrients. The scale of the problems varies from a particular field to a whole catchment. Our research addresses a comprehensive integrated approach to evaluate impact of measures on both water quantity and water quality aspects.

Irrigation and Drainage

To develop and integrate irrigation and drainage truly in the context of water quantity and quality dynamics

Resolving the major problems of water scarcity and quality in the irrigation and drainage sector in an environmentally and financially sustainable manner requires location specific adaptations in land and water use. We assist governments and agencies in identifying and implementing such solutions at field, system, and catchment scales

Integrated modeling

To develop advanced integrated tools to quantify the impact of climate and global change and to explore the impact of various management and adaptation strategies.

We develop our own state-of-the-art integrated hydrological models and continuously update them with our knowledge of irrigation, drainage, and water quality. These tools are intensively used to conduct system analyses and to evaluate land and water management scenarios all over the world

Supporting water governance

To integrate technical and non-technical approaches.

Our team is composed by specialists who have complementary, but synergetic expertise and skills, which enables us to integrate the various aspects of IWRM, both technical and institutional. Collaborating with our partner institutes, we cover a broad, multidisciplinary field of expertise to support water governance and policy making.