

→ Sustained agricultural and forestry production systems, food processing and safety

Water Resources Management



The issue at stake

Water is life. All living organisms depend on water and the sustainability of human development is critically linked with the hydrological cycle, since water is essential for food production and all living ecosystems (World Water Council 2005). Water is a renewable resource, made continuously available through the water cycle by which water evaporates from oceans and land and is redistributed around the world, feeding rivers and refilling aquifers (World Water Council 2005). Although water is abundant on our blue planet, less than 3% of all water is freshwater and only 0.3% is easily accessible to humans in rivers and lakes, most of the rest being frozen. Freshwater resources have remained constant during centuries, but population growth and rising consumption has resulted in rapidly declining per capita availability.

Seventy, and in developing and transitional countries up to more than eighty percent of all water withdrawn is used for the irrigation of agricultural crops. Due to continuing population growth, changing dietary habits and an increasing demand for bio-energy, agriculture will have to produce even more goods in future. Development in other sectors and rising household water needs will increase water demand for other than agricultural uses. Agriculture therefore faces a massive challenge to produce more with a reduced share of the available water. Fortunately, there are vast opportunities for more productive water use in agriculture as well as in other sectors, and for better coordination of water allocation to different use(r)s.

Approach by the HAFL

Since most of the water withdrawn flows into agricultural production, even small reductions in agricultural water use may release significant amounts of water for other

sectors and users. We therefore consider increasing water productivity in irrigated as well as in rainfed agriculture (crop and livestock production) crucial in order to meet the acute freshwater challenges facing humankind in future. Since certain agricultural practices are responsible for deteriorating water quality, we investigate ways to reducing water pollution through agricultural activities. Recognising that management, organisational and policy aspects are key to rational and productive water use, we not only consider technological improvements in water resources management in our activities, but we also deem it important that all aspects related to integrated water resources management (IWRM) are taken into account and that water management is approached in a holistic way.

Furthermore, we are convinced that strengthening awareness and understanding about rational and productive water management is a prerequisite to realising the potentials for using water more efficiently. Although many technologies, management practices and policy approaches to increasing water productivity are known, specific research questions still need to be answered to fully capitalise on the options we have at hand to use water optimally.

Expertise and services offered by the HAFL

Our expertise in the domain of water resources management covers a vast array of technological options in irrigated and rainfed agriculture (crop/fodder production and livestock husbandry) to increase water productivity, such as crop choice and cropping patterns, increasing crop productivity, soil and salinity management, water harvesting and conservation, irrigation systems and practices. We have developed tools to evaluate water productivity in



practice and investigate options to increase the value produced by adequate irrigation (e.g. through improved quality) and thus profitability for the farmers. In collaborative (research) activities with international organisations (such as FAO, International Livestock Research Institute, ILRI, and the World Bank) we develop and promote agricultural practices that protect water quality, especially from intensive livestock production. We support partners in the organisational and strategic management of water resources, including water allocation and distribution, water demand management, and collaborative watershed management.

Our applied research embraces aspects related to virtual water (trade) and associated policy options as well as technological aspects to improve water productivity in agricultural practices. Furthermore, we are involved in improving the information flow among researchers, farmers and decision/policy makers. Our staff can draw on experience regarding water management in many dry areas in the Middle East, Central Asia, North and sub-Saharan Africa, Central America, the Indian subcontinent and Europe.

In practical terms, the HAFL provides the following services:

- Development of project ideas, proposals and project documents as well as project/programme evaluations; implementation of projects and specific tasks.
- Conducting studies and reviews in the area of water resources management, responding to specific research questions; reviewing papers and proposals.
- Applied research/development of tools allowing for productive use of water in agriculture
- Providing support and consultancy services based on our adaptive/applied research, e.g. in the areas of micro irrigation, water harvesting/conservation options, or sustainability of production; development and promotion of adapted options to be applied in the field.
- Strategic guidance and technical backstopping of other initiatives/activities in the area; support by connecting stakeholders through our extensive network of contacts.
- Replying to enquiries from students, projects, NGOs, etc.
- Awareness building through presentations (conferences, schools, TV), courses and modules, articles, etc.

Expected development impact

- Rational and efficient use of water and land resources.
- Higher water productivity in agricultural production, thereby reducing pressure on water resources and freeing up water for other uses and allowing for improved livelihoods.
- Better concerted action among water users (strategic planning, dialogue, Integrated Water Resources Management).

- Increased awareness and understanding of rational and productive water management.

A selection of experience

- Potential for market-oriented vegetable production by small-scale farmers using micro irrigation technologies in Nampula province, Northern Mozambique; project feasibility and planning mission for SDC
- Tackling water scarcity and rural prosperity in West Africa; feasibility studies for an SDC-funded IDE (International Development Enterprise) project in Burkina Faso and Niger
- Fairtrade Water Project / water studies: Development of a tool for small-scale farmers that allows optimizing farming operations (in terms of income and water productivity) under rainfed and irrigated cropping.
- Project Preparatory Technical Assistance (PPTA) for a Community Irrigation Project (ADB, Government of Nepal); Planning missions for SDC
- Design of the 'On-Farm Water Management Project' in Kyrgyzstan; planning mission for Helvetas.
- SDC Water Productivity Improvement Project, implementation phase (Uzbekistan, Kyrgyzstan and Tajikistan); planning mission for SDC.
- Collaborative watershed management in Kahmard (Bamyan province), Afghanistan; information and planning mission for Helvetas.
- Integrated water resources management in Ferghana valley (Uzbekistan, Kyrgyzstan and Tajikistan); external review of project phase III and IV, SDC.
- Introducing affordable drip irrigation in the coffee value chain in Nicaragua (public-private partnership project with Nestlé S.A, ECOM Group, IDE International and the Rainforest Alliance).
- Optimising irrigation and fertigation in potato production to increase yield, quality and supply stability.
- International Assessment of Agricultural Science and Technology for Development (IAASTD); coordinating lead author in the Sub-global Assessment of Central and West Asia and North Africa (strong focus on water resources management).
- Guidance/support to Nestlé's Water & Agriculture Programme.
- Relevance of the concept of "Virtual Water" for the activities of the Swiss Agency for Development and Cooperation SDC.
- Development of irrigation and soil conservation extension messages for the Kyrgyz Rural Advisory Service (RAS) as well as for the Organic Cotton Production project (Helvetas).
- Livestock Waste Management in East Asia Project (LWMEAP) in China, Thailand and Vietnam.
- Area-wide integration of specialised livestock and crop production (China, Mexico, Thailand and Vietnam).



- Assessment of manure and nutrient management of livestock farms and their ecological relevance in the south of Myanmar.
- Planning and project document for SDC's "People and Resource Dynamics in Mountain Watersheds of the Hindu-Kush Himalayas" project (PARDYP), Phase III (Nepal).
- Framework Paper for the UNCCD Thematic Programme Network 4 (TPN4) on "Water Resources Management for Agriculture in Arid, Semi-Arid and Sub-Humid Areas" of the Asia Regional Action Programme.

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