



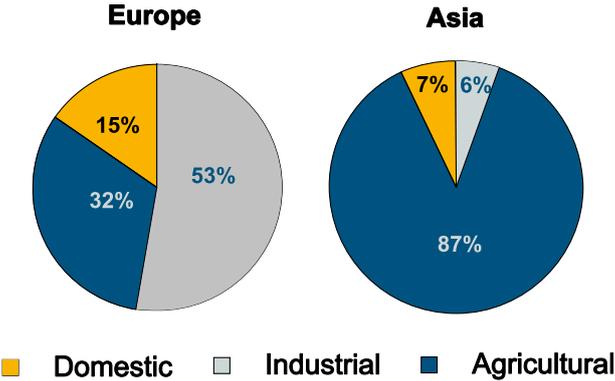
## FOOD SECURITY – EVERY DROP COUNTS

### Helvetas' approaches and experiences in water management

Fresh water resources are inequitably spread around the world so that available water becomes scarce in many regions. A few litres of water are enough to quench someone's thirst; however one person's daily food requires about 3500 litres to be produced. In developing countries, one out of six persons is undernourished and 80% of them live in rural areas. Additionally, food production will have to meet the need of two billion more people by 2050. As the effects of climate change may jeopardize food production in critical areas because of erratic rainfalls, raising temperature and more extreme weather events, a more efficient water use and integrated management is needed to address local and global food requirements, and to contribute to food security. Thereby, water management and improved irrigation practices may substantially increase food production and strengthen rural population's resilience.

## WATER RESOURCES AND SCARCITY

Today lack or scarcity of water to meet daily needs concerns a third of the world population. As result of changing rain patterns, steadily increasing water demand and pollution, more than 2.8 billion people may face severe water shortage by 2025. Appropriate water management approaches and measures promote sustainable and equitable share of available resources, considering changing needs and varying resource conditions. Interestingly, 70% of fresh water use in the world is dedicated to agriculture, although very large differences are observed according to the region.



Food production requires about one litre water per calorie. So, an average of 3500 litres of water is necessary to produce one person's daily food, only 2 or 3 litres are needed for drinking. But food regime strongly influences water needs, e.g. one kg cereals require 1'500 litres of water for its production, while one kg of beef requires 15'000 litres. Furthermore, change of diet in emerging economies is boosting meat consumption, thus increasing water demand even more. General food demand may double in the next 50 years, while bio-fuels are competing for arable lands. In this context, the issues to be addressed include conceptual and methodological concerns, technical improvements, institutional reforms, controlled management, and appropriate investments.

Furthermore the effects of climate change such as extreme rain events and long droughts are becoming more frequent. As a consequence, land degradation in developing countries may become more serious and jeopardize food production. In response, adaptation to climate change must focus on integrated land and water management, and address food requirements of the most vulnerable. Among the options, rainfed agriculture has to be upgraded and soil conservation measures are to be encouraged. Thereby, Helvetas acts at specific levels to support local communities in improving water management and food production strategies.

## WATER EFFICIENCY

### Experiences from Kyrgyzstan

Unequal water allocation and overuse have lead to water shortage because of old and deficient channel irrigation techniques remaining from the former Soviet Union. Helvetas supports innovative water saving techniques and intervention approaches which contribute to more efficient water use.



Traditional furrow irrigation in Kyrgyzstan

Improved furrow irrigation, water measurement techniques, contour furrow and water harvesting have been implemented to control and improve water efficiency as well as to decrease erosion and land degradation.



Drip irrigation system in Batken, Kyrgyzstan

Applying drip irrigation in special cases has decreased irrigation water volume by 2.5 to 6 times and labour cost by 6 to 8 times, through reducing work load. Twice less fertilizer is used and the efficiency increased because of local and direct application to the plants. The gain in efficiency also benefits soils and groundwater quality. General decrease in air and soil humidity lessens the diseases and weeds damaging the crops. Regulated input of fertilizers and water doubled the crop yield. In 2009, 400 farmers were introduced to drip irrigation in Kyrgyzstan.

### Experience from Bhutan

Controlled irrigation has been supported in Bhutan to alleviate climate and rainfall regime constraints. The off-season vegetable production is fetching high prices in the market and thus enhances the farmers' income.

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Drip irrigation for market gardening in Bhutan



© Jacques Tamini

Embanking in Mali

### Experience from Haiti

Helvetas supports the rural population in their efforts to rehabilitate watersheds through integrated management practices. Emphasis is put here on agricultural efficiency with water control and adapted crops.



© Peter Schmidt

Watershed management and water control in Haiti

Small canals have been renovated to better control water and improve irrigation efficiency in combination with anti-erosion measures and capacity building for water users. The issue of food production is combined with income generation perspectives and measures to increase resilience.

### Experience from Mali

Long dry periods and land tenure related conflicts jeopardize food production in Mali. With a better control of water the rural population can significantly increase crop yield and crop diversity, leading to enhanced food security, income generation as well as healthier diet. In this regard, Helvetas supports the implementation of irrigation infrastructures and water management schemes. Beside, further measures aim at strengthening the local and national institutional framework.

## INSTITUTIONAL ARRANGEMENTS

### Experience from Nepal

The concept of Water Use Master Plans (WUMP) has been developed and implemented in Nepal to achieve effective, equitable and efficient use of water by promoting and facilitating water planning and management to the community level. Based on an Integrated Water Resources Management (IWRM) approach, Water Use Master Plans are developed through participatory, mainly bottom up planning processes. These processes focus on consensus building among community members and between communities that water resources need to be shared equitably and fairly in a sustainable manner for different uses.

In Nepal, 20% of the people are land-less or land-poor. Helvetas supports institutional and technical arrangements enabling over 3000 landless families to cultivate crops in dry riverbeds resulting in an annual additional family income of 500 USD. The possibilities for expending this experience may allow up to 500'000 people to benefit from unused arable land and generate income to escape extreme poverty.



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Riverbed farming during the dry season in southern Nepal

## ADAPTION OF CLIMATE CHANGE

The region of Tigray in northern Ethiopia faces high drought risks and food insecurity caused by unsustainable exploitation of natural resources, erratic rainfall patterns and severe consequences from climate change. Taking into account this history and background, a project on cactus production, linked to food security and value chains, has been broadened into a natural resources rehabilitation / watershed management project together with local communities and government authorities. This project will increase stability and productivity of sloped land, enhance the resilience of local communities to climatic shocks and improve their livelihoods.



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Cactus: water saving, soil protecting, fruit, food and fodder providing plant promoted in the drought prone highlands of Ethiopia  
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### Further readings:

FAO – Food and Agriculture Organization of the United Nations: <http://www.fao.org/nr/water/>

“Water for food water for life” A comprehensive assessment of water management in agriculture.2007:  
<http://www.iwmi.cgiar.org/assessment/>

World water assessment program from UNESCO: <http://www.unesco.org/water/wwap/>

International fund for Agriculture and development : <http://www.ifad.org/english/water/index.htm>

CGIAR challenge program on Water and Food : <http://www.waterandfood.org/>

Inforesources publications, FOCUS n3/06 Water for Food – A Matter of Survival: [http://www.inforesources.ch/pdf/focus06\\_3\\_e.pdf](http://www.inforesources.ch/pdf/focus06_3_e.pdf)

Community of practice of the Swiss Agency for Development and Cooperation: <http://www.sdc-water.ch/>

The Dublin statement on water and development -<http://www.wmo.int/pages/prog/hwrp/documents/english/icwedece.html>

### According to FAO:

**Irrigation increases the yields of most crops by 100 to 400 percent, and irrigated agriculture currently contributes to 40 percent of the world's food production.**

**Over the next 30 years, 70 percent of gains in cereal production are expected to come from irrigated land.**