Federal Ministry
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An Initiative of the Federal Ministry of Education and Research
GRoW
WATER AS A GLOBAL RESOURCE

TRUST – Integrated Drinking Water Supply in Prospering Regions with Water Shortages

Water as a Global Resource (GRoW)

Climate change is exacerbating water shortages, especially in regions that are already struggling with water scarcity. The area surrounding the burgeoning Peruvian capital Lima, for instance, is particularly hard-hit. The city is located in the coastal desert at the foot of the dry west side of the central Peruvian Andes. The lion's share of the city's drinking water originates from the Rimac River, which frequently has a restricted flow owing to the dry climate. The city therefore increasingly relies on groundwater for its supply, meaning these resources are severely stretched to meet the high demand for drinking water as well as industrial and agricultural irrigation water. As part of the joint research project TRUST, experts from various disciplines are collaborating to develop holistic planning tools as well as innovative water supply and sewage disposal concepts based on the example of the Lima region.

Sound Data Basis for Cleverer Decision-Making

In Peru, as in many other regions of the world, there is a lack of comprehensive data on the quantity and quality of the available water resources. Suppliers and planning authorities can only achieve effective water resource management, however, if they have access to sufficient information on the condition of the country's water bodies. In collaboration with four partners from industry and water management, researchers from the fields of engineering as well as from the natural and social sciences based in Stuttgart and Karlsruhe are therefore seeking to develop innovative methods of collecting and recording necessary data for the Lima region. To this end, water experts have been conducting field campaigns and have developed a hydro-meteorological monitoring network with regional stakeholders. This network furnishes information on the distribution of precipitation, runoff behaviour, and flow velocity in the region. The data acquired on the ground is supplemented by data obtained using state-of-the-art remote sensing techniques. On the basis of this data – acquired both on site and using remote sensing – project researchers are able to model regional water supply far more accurately than was previously the case. In addition, one of the project partners is developing an application that will give the general public as well as suppliers, planners or farmers access to available data online.

Sustainable Water Resources Management

Building on these results, the project partners are seeking to develop optimized overall management concepts for water supply, sewage disposal and water reuse. Their objective is both to use the limited available water resources in the most efficient way possible and to involve local stakeholders in the development, evaluation and planning of dedicated concepts. The biggest challenge here is, using existing resources as sparingly as possible, achieving the primary goal to secure the supply of clean drinking water, while meeting the water needs of competing sectors such as agriculture and industry at the same time.

A newly developed software-based decision support system (DSS) will help local utility companies to identify areas with a high risk of water contamination and to define measures needed to ensure safe drinking water despite these conditions. TRUST thus combines state-of-the-art remote sensing methods, regional water balance modelling and strategic decision-making tools. In order to provide a comparison for the Lima region findings, and to ensure

A water reservoir in the upper drainage area of the Lurín River in the province of Lima provides irrigation water during the dry season

that these results are transferrable, the drainage area of a reservoir in Saxony (Germany) is also included in the analysis. This means that the new concepts can also serve as a successful model for other regions with similar problems.

Negotiating Interests Using New Participation Processes

Decisions made by stakeholders in the water sector can lead to conflicts over water use, for example between commercial agriculture and the general population. In order to avoid this, within the framework of the TRUST project, potential conflicts are to be analyzed and different interests negotiated using special participatory procedures. Supported by a partnering consulting company, social science researchers are developing approaches that are adapted specifically to local conditions so as to ensure that those affected are involved in the process. Using this method gives different interest groups an opportunity to present their views on the water system. It aids to identify those combinations of water management measures, which enable the achievement of rival objectives in the most conflict-free way possible. To help establish the methods developed and embed the project results in the region, TRUST also provides support to local partners in the form of dedicated training programs and educational activities.

School students visit a drinking water tank in the district of San Andrés de Tupicocha, Huarochirí province, Peru

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Water as a Global Resource (GRoW)

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