

# Working together for clean water

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Rio Lurín/Peru in the dry season. Credit: University of Stuttgart/Christian León

The availability and sustainable management of water as well as safe sanitation for all are important goals of the United Nations' 2030 Agenda for Sustainable Development. But how is this to be achieved in a country

like Peru, where water is scarce but more and more of it will be needed due to population growth and the economic boom? To this end, the TRUST project developed concepts that combine research and practical knowledge from the natural, engineering, and social sciences and involve those affected at the local and regional levels. The final report, which is now available, results in five theses and a total of 20 recommendations for water resources, water use, and water management.

## **1. Understanding and protecting water resources**

Project manager Christian D. León from the Center for Interdisciplinary Risk and Innovation Studies (ZIRIUS) at the University of Stuttgart sums up: "for good water resource management in regions of water scarcity, we need a solid database on how much water is available in the first place, and an awareness among the population that water is a valuable asset." However, both of these requirements are lacking in countries like Peru. It is therefore important, to set up a minimum number of measuring stations at strategically chosen locations and to supplement these with satellite-based measurements for one thing. Second, he says, education campaigns are needed that focus on dialog with the public and address the health risks associated with water quality.

## **2. Resolving conflicts through joint water use planning**

In arid regions, agriculture, industry, and the population are competing for the scarce resource of water. This conflict cannot only be described in terms of objectives, but can be resolved holistically. "We need joint [water management](#) planning that shows how one action, such as the use of groundwater for irrigation in agriculture, affects other players and their actions. For this purpose, we at ZIRIUS developed a model based on systems analysis that compares different combinations of measures

and shows their effects," says León.

### **3. Tailored solutions for on-site water management**

Good water supply and sanitation can only work if local players—often volunteers—are involved and their cultural and social characteristics are taken into account. For people to be willing to pay for water, it is important to raise awareness of its value. At the same time, incentives should be provided for the economical use of the resource. Information events that link the topics of water and health are useful for this purpose.

### **4. Improving wastewater treatment and wastewater reuse**

In addition to groundwater, treated wastewater is an important resource for use in industry or for irrigation in agriculture. However, [treatment plants](#) in Peru—if they exist at all—are often outdated and poorly managed. "First, treatment plants must be built all over the country that are in accordance with the state of the art, and many existing plants need to be made more efficient. In addition, it is important to provide better training for the employees," emphasizes Ralf Minke from the Institute for Sanitary Engineering, Water Quality and Solid Waste Management at the University of Stuttgart. Since natural seeping surfaces are becoming scarce due to the construction boom, it is also possible, for example, to create artificial seeping surfaces. On these, largely treated wastewater that is not directly reused can be returned to the groundwater.

### **5. Design and operation of water supply and wastewater disposal systems**

For the purification of drinking water, adapted and nature-based low-tech solutions are needed that are affordable, low-maintenance, and not

likely to be vandalized. Treatment plants, however, need to be based on a technology that allows a consistently high cleaning performance at low operating costs (e.g. using the trickling filter method). In order to ensure optimal operation, data series are required that, over 24 hours, continuously provide information about the quality of the incoming and outgoing [water](#).

In cooperation with the municipality of San Andrés de Tupicocha, the local Sanitation and Services Administration Board (JASS), the TZW, and local NGOs, scientists from the University of Stuttgart built a training and [pilot plant](#) for [wastewater treatment](#) in the highlands of Peru where the integrated concepts developed in TRUST can be demonstrated. Due to the COVID-19 pandemic, work had to be stopped temporarily, but the plant was completed in time for the end of the project.

**More information:** [trust-grow.de/wp-content/uploa ...](https://trust-grow.de/wp-content/uploads/2021/05/Trust-Report-Web.pdf)  
[TRUST Report Web.pdf](#)

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