

Water scarcity in Saudi Arabia and other arid and semi-arid regions means that sound management of this precious resource is essential.



A BOOST FOR SCIENCE

In the Earth's drylands, a growing population and rising living standards are driving up water consumption. Drawing on the wealth of experience gained through its advisory work, GIZ is cooperating with the research community and contributing to the international scientific debate.

Text Norbert Glaser

Whether it's strawberries, peppers or tomatoes – we are accustomed to most types of fruit and vegetable being available all year round, even in winter. These crops come from countries warm enough to grow them when temperatures plummet in Europe. But many of the growing areas suffer from chronic water shortages. Fields are irrigated with groundwater – in many drylands, the only source of drinking water for local communities. But unless the abstraction and use of water resources are properly managed and regulated, groundwater reserves can become depleted with alarming speed.

With water demand in an increasingly thirsty global farm sector expected to rise by a further 20% by 2050, a 'business as usual' approach means that four billion people out of a projected world population of nine billion will face extreme water scarcity. To avert this scenario, science and research must develop new and sustainable models for the management of groundwater resources.

The interdisciplinary conference on 'Hydrogeology of Arid Environments' in Hanover in early 2012 brought together some 200 scientists and experts from more than 30 countries to discuss groundwater management issues in the world's drylands, with a particular focus on the Middle East and North Africa but also Chile, Namibia and India. The conference was convened by the Hydrogeology Working Group of the German Society for Geosciences (DGG), the Federal Institute for Geosciences and Natural Resources (BGR) and Technische Universität Darmstadt. Urgent action is needed, as the example of Mo-

rocco shows: 'Twenty years ago, enough water could still be found at a depth of 30 to 40 metres in the Plain of Souss-Chtouka,' Younes Fakir from the Cadi Ayyad University of Marrakech (UCAM) told the conference. Extensive vegetable fields and fruit plantations cover much of the plain. However, the situation is becoming increasingly critical. 'The surface waters are being exploited to their limits, and groundwater resources are almost exhausted. The water table has now sunk to a depth of 270 metres.'

Better technology protects reserves

Better technology and more stringent regulations are intended to alleviate the situation. On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and in cooperation with the German Federal Institute for Geosciences and Natural Resources, GIZ is advising public authorities and local water agencies on ways of establishing integrated water resources management (IWRM) regimes. Besides mathematical modelling programmes to monitor groundwater resources and predict future trends, GIZ is assisting local water agencies to conclude groundwater contracts with users, especially farmers, in order to regulate water extraction on a long-term basis. These are key building blocks which will determine the success of Morocco's national water sector development strategy. Morocco is one of the countries which will be particularly impacted by climate change, so here and elsewhere, GIZ is working with academic

and private-sector partners to produce detailed studies of water resources, the aim being to make good the widespread lack of accurate and reliable data which form the essential basis for policy-making and the development of water management strategies. In Saudi Arabia, »

RESEARCH AND ADVICE

Since 2003, GIZ International Services and Dornier Consulting have been conducting detailed studies of water resources on behalf of the Ministry of Water and Electricity and the Ministry of Economy and Planning of the Kingdom of Saudi Arabia. The purpose of the studies is to assess the water budget and determine the extent and availability of groundwater reserves. The findings of the studies form the basis for the development of Saudi Arabia's national water strategy. Scientific support is provided by the Helmholtz Centre for Environmental Research and Technische Universität Darmstadt. The cooperation between the consulting industry and the research community makes it possible to deploy state-of-the-art methodologies and harness the know-how that is vital for 'smart' water resources management nowadays. The expertise acquired by GIZ and Dornier Consulting in Saudi Arabia can also be used to develop best practice in other dryland regions of the world.

» INTERVIEW

Working together for progress



Professor Stephen Foster spoke in Hanover about the complex relationship between irrigated agriculture and groundwater resources in arid regions. Foster is a Senior Adviser at the Global Water Partnership* and Past President of the International Association of Hydrogeologists. akzente took the opportunity to speak to him about collaboration between scientists and development practitioners.

How can international cooperation programmes contribute to the scientific debate?

The international debate about groundwater issues greatly benefits from the knowledge gained in development programmes. It would be impossible for us, otherwise, to obtain sound scientific data from certain regions of the world.

Are there any other synergies?

Water researchers and development practitioners can have somewhat divergent concerns and their day-to-day work can lead in different directions – for example the former often put greater emphasis on long-term resource sustainability and the latter on immediate development goals. Interdisciplinary dialogue provides important impetus for developing the ‘state of the art’ in both fields. So there are good reasons why Germany supports scientific analysis as well as practical advisory programmes.

How important is the exchange between scientists and practitioners?

In my work in Botswana back in the 1970s, I saw an especially clear example of how important it is to achieve an integrated vision. At that time, various development agencies were taking diverse approaches to improving the health and welfare of a town of around 40,000 people. Some were digging shallow wells to improve water-supply access, and others were providing in-situ sanitation, while a third group had provided doctors to improve health care. After a few years the doctors started to wonder why there was such a high level of antibiotic resistance exhibited by fecal pathogens in the community, and it was only when an integrated scientific study was undertaken that the interlinkages were revealed, and the need for an adequately protected groundwater supply was identified.

Interview: Norbert Glaser

* The GWP is a network of developed and developing country government institutions, United Nations agencies, development banks, research institutions, professional associations and the private sector. Germany provides financial support to the GWP, and GIZ is represented on their Board.

GIZ International Services works with partners Dornier Consulting, Technische Universität Darmstadt and the Helmholtz Centre for Environmental Research.

The Kingdom of Saudi Arabia is one of the water-poorest countries in the world, so water supply is a highly significant issue here. ‘The

key prerequisite for optimised management is to survey and assess the existing resources,’ GIZ expert Randolph Rausch told the conference. ‘The groundwater resources have been well-developed since the 1970s, with an extensive network of wells. But we want to know exactly what inflows and outflows exist in the ground-

water system and how much water is still available underground.’

The results of GIZ’s work in Saudi Arabia flowed into the debate at the Hanover conference in a variety of ways. A wide range of results were presented, including mathematical models simulating groundwater flows and studies on groundwater quality.

The conference also aimed to identify research gaps and areas where there is an acute need for action – for whereas the world’s population has quadrupled in size over the last 100 years, its water requirements have increased tenfold. Climate change is exacerbating the situation in arid and semi-arid regions. Now more than ever, these regions need viable and sustainable strategies for the future development and management of their groundwater resources.

Accepting natural limits

The first step is to recognise the value of water. As Saudi Arabia’s Deputy Minister of Water and Electricity, Mohammed Al-Saud, emphasised: ‘We must look at our water resources in the same way as our oil. Most of our water resources are finite and non-renewable. So it’s completely uneconomical to waste them on agricultural mass production.’ In this Arab country, this insight has already had far-reaching consequences: the King issued a decrease prohibiting the cultivation of water-intensive crops, resulting in a strong decrease in areas under irrigation, and wheat-growing is to be phased out by 2016. Only a few years ago, Saudi Arabia was still exporting its surplus wheat.

‘Today, we’re importing foods instead of producing them ourselves and consuming our limited water resources,’ says Al-Saud. ‘As a wealthy country, we have had to accept that we have natural limits.’ Admittedly, Saudi Arabia has it easy in some ways: in many cases, the state provides the necessary investment and the change of course is relatively straightforward. In many other dryland regions, the transition is likely to present more of a challenge. ■

» CONTACT

Randolf Rausch > randolf.rausch@giz.de