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Focus on:

The water dialogue

Providing water for everyone

Yemen:

Water equations at the birthplace of algebra

The Nile River and Southern Africa:

A round table for riverbasins

Bolivia:

Pressure in the pipes

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Cover:
Jordanian boys with water sacks. Photo: Hartmut Fiebig

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Heidemarie Wieczorek-Zeul,
Federal Minister for Economic Cooperation and Development

Dear readers,
One of the central topics of the World Summit on Sustainable Development in Johannesburg was to secure water supply world-wide. Water plays a key role in combating poverty. More than 1.3 billion people have no access to clean drinking water. Without clean water, diseases remain on the increase, and without sufficient water there can be neither food security nor economic development.

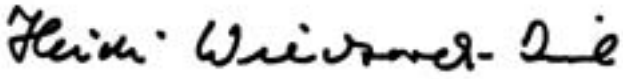
The Millennium Declaration of the United Nations has set us the target of halving the share of the world's population without access to clean drinking water by 2015. German development cooperation has adopted its part of this task. Securing vital water resources is one of the ten priority areas in the Federal Government's Programme of Action for combating poverty. Our goals are: providing the population with drinking water, conserving the natural resources and using water efficiently in the context of integrated water resources management. This includes both rural and urban drinking water supply and consultancy on water sector reforms as well as the use of hydropower and irrigation in agriculture.

The private sector is playing an increasingly important role in drinking water supply. We are supporting the involvement of private sector enterprises in the water sector, for example by advising our partner countries on the creation of framework conditions that attract investment. At the same time, regulation by governments and local communities has to be organised with a view to getting the water to where it is most urgently needed, i.e. among the poorest sections of the population.

German development cooperation is also making an important contribution to regional cooperation and, therefore, to conflict prevention along international water courses. For instance, the Nile Basin Initiative that was launched in 1992 has made a substantial contribution to confidence building among the riparian states. The German Government has been supporting international initiatives to resolve conflicts for several years. In this context, the 2001 Bonn Freshwater Conference took up issues discussed at a number of forums that had been initiated and organised by Germany. The results of the Bonn Freshwater Conference have formed the negotiating basis and starting point for concrete implementation strategies in the water sector at the world summit in Johannesburg.

Now, the concepts and goals must be followed by rigorous implementation so that in 2015, more people will have access to clean drinking water and therefore more prospects for development, which in turn would crucially reduce poverty in our world.

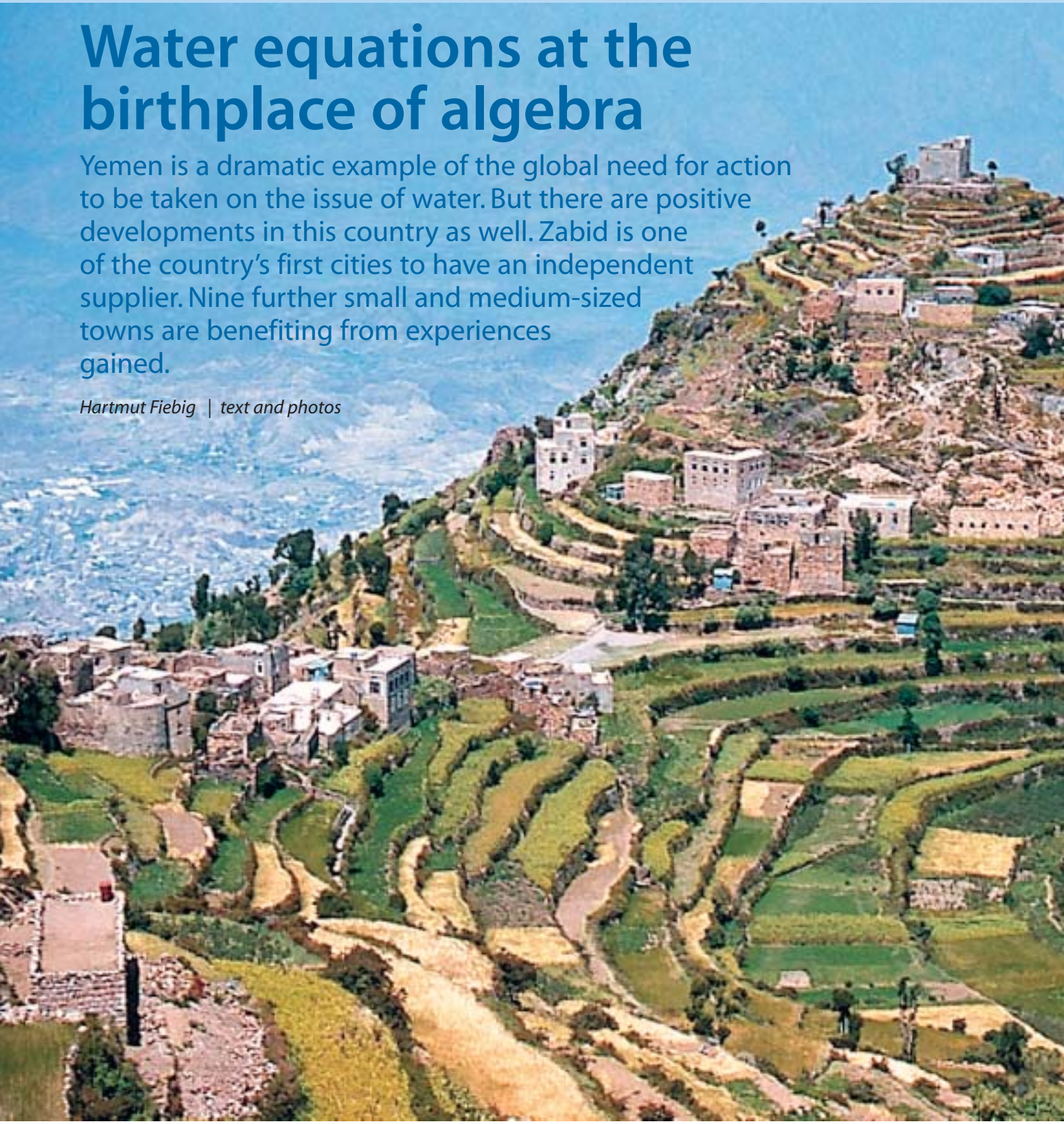
Yours,



Water equations at the birthplace of algebra

Yemen is a dramatic example of the global need for action to be taken on the issue of water. But there are positive developments in this country as well. Zabid is one of the country's first cities to have an independent supplier. Nine further small and medium-sized towns are benefiting from experiences gained.

Hartmut Fiebig | text and photos



Around 170 kilometres east of the Yemenite capital of Sana'a, the remains of a 2,500-year-old dam stand in the middle of the desert. What looks like an antique misdirected act of the Sabaans at first glance does in fact bear testimony to the masterly way the sunken southern Arab kingdom treated its most precious good: water. The imposing constructions channelled the sporadic floods into a complicated system of canals.

With this brilliant achievement of hydraulic engineering, the Sabaans managed to wring 10,000 hectares of arable land out of the desert, which was enough to supply food to the inhabitants of Marib and the great merchant caravans of the incense road who would stop over in this city on their way from the Indian Ocean to the Mediterranean. Remains of a sophisticated antique water supply system can also be found in the mountains of Yemen. More than 2,000 years ago, people even farmed the steepest slopes. The elaborate terraces and irrigation systems gave rise to the myth of Arabia Felix, fortunate Arabia.

Unlike the rest of the desert peninsula, the mountains of Yemen are blessed with rainfalls. The monsoon blows them over from the Indian Ocean. However, the green shroud of vegetation that covers the mountainous countryside during the summer months conceals the fact that there is a serious shortage of water in today's Yemen. Have Saba's sons lost their sense of water?

Overexploitation of groundwater

Two-and-a-half billion cubic metres of water is regenerated by the rainfalls in Yemen each year. "However, almost a billion cubic metres is additionally taken from the groundwater. So we are massively overexploiting our resources," says Anwar Sahooly, chairman of the government's Technical Secretariat for Water and Sanitation Sector Reform in Sana'a. There are more than 40,000 deep wells that pump the water to the surface without any consideration being given to sustainability. And these wells are causing Sahooly particular concern. "This results in groundwater levels dropping by up to six metres a year in some regions," he explains. "There are places where the drill heads already have to bite their way through 1,000 metres of rock before they hit on water."

Many urban regions are affected by water scarcity. The worst hit are Sana'a, Ta'iz, Yemen's third largest city and, above all, Sa'ada, close to the Saudi Arabian border. The situation is also tense in rural areas. Many of the old reservoirs, terraces and irrigation systems have been

Expensive water vendors. Making a profitable business out of the water supply plight is now over. The municipal water service has improved considerably.

given up over the last 30 years. Instead of traditional rainwater harvesting, the farmers who can afford to do so now prefer to drill deep wells. For the lucrative commercial crops, whether it be the popular drug qat, vegetables or fruits, are all vulnerable to drought. Those who cannot afford to build and operate wells are left in the cold.

"We are facing a barrage of problems," says Anwar Sahooly, pointing to the facts. "Statistically, each of our citizens could still enjoy 481 cubic metres of water in 1960. But this was halved by 1990. And trends indicate that, if we do not want to live on our capital, every Yemenite will only be entitled to a meagre 70 cubic metres by 2025." The main reason for the tense situation is the strong growth of the population, which, at 3.8 percent, is very high in comparison to other countries. Statistically, every Yemenite woman has seven children. In just 20 years' time, the number of people will have doubled to 36 million.

Conflicts about water rights

One consequence of the shortage is that urban settlements and rural areas which still have sufficient water resources are now squabbling about water rights. For the level of food self-sufficiency is constantly sinking. Food purchases are already causing the highest import costs for the Yemenite economy. And in the foreseeable future, this can only be changed to a limited extent. In order to extend the area of arable land, agriculture would require huge amounts of water. For out of 550,000 square kilometres of land, just 1.6 million hectares can be used for farming. By far the larger part of the country consists of rugged mountains and hostile desert areas. But already, agriculture is consuming 92 percent of the precious water resources.

And the disproportionately high levels of population growth in the cities, higher demands among the city-dwellers and the development of the economy and industry that is to be reckoned with are adding to the urban regions being pushed aside in terms of water supply. For sustainable water use the insight is lacking on both sides that all people are mutually dependent.

Yemen is a dramatic example of the global need for education and action with regard to water. But there are positive developments as well, for example in the city of Zabid, which has a population of 20,000 and is situated in the hot and damp coastal plains in the hinterland of the Red Sea. "There used to be water every two days at best, and water pressure was not even sufficient for the water to reach the first floor," an inhabitant recalls. This is why many inhabitants had to leave their old houses, the buildings the city is so famous for. But now that most of them are connected to the mains system, the people are returning to the old city. GTZ was commissioned by the Federal Ministry for Economic Cooperation and Development (BMZ) to support the local successor of the National Water and Sanitation Authority in setting up and extending the drinking water mains system.

Commissioned by the Federal Ministry for Economic Cooperation and Development, GTZ has supported the local successor of the National Water and Sanitation Authority (NWSA) in developing the drinking-water mains.

In addition to the city of Zabid, GTZ is now advising nine further small and medium-sized towns in various parts of Yemen on organisational, economic and technical issues of water supply. The Provincial Town Programme (PTP) provides the framework for Technical Cooperation. In order to prepare the utility for the period after its civil service torpor, the employees had to be trained and upgraded in management and business organisation, accounting and invoicing, operating and maintaining the mains network and pumps or in using the computer to draw water mains pipes.

Without these qualifications, the projects of Financial Cooperation would hardly have been sustainable either. Kreditanstalt für Wiederaufbau (KfW) is providing BMZ funds to

see to it that the water supply and sanitation systems are overhauled, extended and newly constructed. Around seven million euros are available for nine years to this end.

A weakened colossus

GTZ staff member Yusuf Al-Ambari is a member of the advisory committee, which is represented in various decision-making bodies and is to raise both the transparency and accessibility for the citizen of the former government-run utility. This is a novelty in Yemen. In the past, the utility NWSA was reputed to be an inefficient, cumbersome state-run enterprise. At political level, it operated as an authority, while it was responsible for water supply and sanitation at local level.

From 1996 on, a World Bank structural adjustment programme resulted in initial reforms towards privatisation and decentralisation. The colossus NWSA appears to be responsible for the greatest omissions in the run-down Yemenite water sector: poor water quality, frequent shutdowns of the water supply system, a chronic lack of capital and, as a consequence, hardly any maintenance or upgrading of the main system. The employees are poorly trained and lack motivation. The NWSA was certainly not a customer-oriented utility.

Reliable service. The NWSA, which once used to be an inefficient state-run enterprise, is to be turned into a low-price, transparent utility in an initial ten Yemenite towns.

Zabid is one of the first cities in Yemen to have had its NWSA branch turned into an independent utility. The chief concern was that drinking-water supply operate according to business management criteria. It was to become reliable, cost-covering and inexpensive. This wind of change did not meet with enthusiasm everywhere. The former civil servants of the water authority realised that their days were numbered, and so did the private water vendors. For they had cashed in on the plight. They supplied water to a large number of households by donkey-cart at almost prohibitive prices. "Often enough, a family had to spend almost a quarter of its income on the purchase of water that was of dubious quality," Al-Ambari recalls angrily.

Surprisingly, many of the consumers went to the barricades. After all, they were supposed to benefit most of all from the changes. The reason was that in the past, they only had to pay a low flat rate for public water supplies that was strongly subsidised for political reasons. The rising water prices made them suspicious. And now there were no longer any subsidies to extend the mains system to the poorer districts, which meant that those who were better off enjoyed privileges that should really have benefited the low-income families.

Much educational campaigning was necessary to convince the households that they would ultimately be saving money with the new system. A reliable water supply would now render the expensive additional purchases of water from private vendors superfluous. Several teams of community workers made house to house calls and visited schools, mosques and health centres to canvass for the project. When the campaign was over, the information centre was turned into a complaints and services office. Here, the consumers can settle queries they might have about their water bills. One clearly intended effect of the water price, which is dependent on consumption, is that it promotes saving water.

The customers appreciate the services of the new water utility. Initial complaints have abated, and the bills are paid punctually. For Yemenite conditions, this is a fantastic success. The pledge to keep water prices low has been fulfilled. Households used to pay private water vendors 50 riyals, the equivalent of about 80 cents, for a 50-litre canister. Now, just eight riyals is charged for the same amount from the mains. The costs of the waterworks, including depreciation, maintenance and reserves, are covered.

In the Middle Ages, Zabid used to be Yemen's economic and political hub, a centre of Islamic erudition, and it is regarded as the birthplace of algebra. The new water tower affords a fantastic panorama of houses arranged higgledy-piggledy and narrow alleyways the unique brick architecture of which earned Zabid entry in the UNESCO world cultural heritage list. However, these architectural

Water sector reforms

The situation. Insufficient management, frequent plant interruptions and permanent difficulties in repairing and maintaining systems are characteristic of water supply and sanitation in the Republic of Yemen.

The goal. Selected branches of the National Water and Sanitation Authority (NWSA) are enabled to run and maintain the systems in a sustainable manner and introduce new plants.

The concept. Consultancy in water sector reforms and decentralisation.

The partners. The Technical Secretariat of the Yemenite Government for the Reform of the Water and Sanitation Sector and the NWSA.

The costs. BMZ is supporting Technical Cooperation in the water and sanitation sector with around seven million euros.

gems are deteriorating increasingly in spite of this protection. Over the past 20 years, around 20 percent of the houses have not survived the trend towards cement constructions. Sewage and rainfalls are eating away at the foundations of the buildings. The sewers are in a state of disrepair.

What is more dramatic than the stench is the hygiene risk, given the heat and the abundance of flies. Untreated sewage is threatening to pollute the local freshwater wells. Just one gram of faeces may contain up to ten million viruses, a million bacteria and 100 parasite eggs. According to the WHO, contaminated water is the world's number one cause of disease. In about half of all the hospital beds there are patients who have infected themselves with bad water. Just one third of the urban and one fifth of the rural households are linked to the sewage system So the sewage problem is acute and makes wastewater treatment an urgent issue. Hopefully, Zabid's next success story will be written by the sewerage workers.

Eberhard Wolf, head of the Yemenite-German project's GTZ team above all sees the value of the Provincial Town Project in its model character. Technical Cooperation demonstrates how a deritalised sector can be modernised according to the guidelines of decentralisation, the integration of local user groups and economic effectiveness. The government's role should be one of providing a regulatory policy framework to control the process effectively and support it. The GTZ team leader believes that integrated water management has an even greater potential to defuse future conflicts and use the resources in a sustainable manner.

Just a third of the urban and a fifth of the rural households in the Republic of Yemen are linked to the sewerage system. Sewage is a volatile problem.

Much could be achieved if the urban and rural sectors were integrated rather than working against each other. The situation could already improve considerably in the medium term if water were consistently used several times, if losses were minimised by the maintenance of systems and behaviour patterns were changed thanks to education. The pollution of resources could be avoided, cost pressure could be raised to the benefit of saving water and sustainable technologies could be employed.

The great dam of Marib operated for about 1,000 years. This antique construction deserved the attribute sustainable because it served as a weir to channel off the water and turned the problem of sedimentation into an advantage. Once the sludge was poured into the fields, it acted as a fertiliser. This is not the case with the dam built in the eighties, just a few kilometres further up the valley. The new dam deposits sediments in the reservoir itself, which is gradually silting up as a result. A lot can be learnt from Sabaan culture. ■

The author is a freelance journalist and photographer who is based in Cologne.

Manuel Schiffler

Better management for the sake of future generations

The World Bank is helping to improve water supply and water resources management in developing countries. Manuel Schiffler works in the World Bank's Middle East and North Africa water department. He has told Akzente how he assesses the prospects for development co-operation in the water sector.

Akzente: Water is becoming ever scarcer world-wide. What are the main problems in the North?

Manuel Schiffler: In the North, the most important tasks are to safeguard the quality of groundwater, flood protection and the rehabilitation of aquatic ecosystems. A further problem is the costs of centralised sewerage systems, particularly in rural areas. For these relatively limited tasks, we have effective water resource administrations and utilities, substantial financial means and a public who are sensitive to environmental concerns.

... and in the South?

In most developing countries, there is a drastic shortage of water, and it is polluted. Societies are hardly in a position to solve the problems. Government structures are too weak or have already collapsed, and the financial means are far more limited. Water demand is on the increase. Rural areas are neglected. In many cities, water is only available for a few hours a day. Slum inhabitants have to pay much more to water vendors than they would have to for piped water. Illegal connections, unpaid bills and water tariffs that are kept low for political reasons are the rule. Thus the public water utilities can hardly improve their performance.

What is the World Bank doing to address these problems?

The World Bank extends almost two billion dollars a year in subsidised loans for water supply and irrigated agriculture. This is a fraction of the investments the developing countries are undertaking with their own means. Larger countries such as China, India, Brazil or Mexico finance almost all their investments themselves, although, of course, their need for investments is even greater. In these countries, the World Bank is above all promoting dialogue and offering advice. The World Bank has opted out of financing large-scale dams and is increasingly active in supporting integrated resource management, saving water, the treatment and reuse of wastewater and in achieving greater participation of users.

How great is the danger of wars being waged for water?

Some of the media are exaggerating in this respect. Water may well play a role in conflicts between states that are hostile to one another for reasons other than water scarcity. These are not water wars. The World Bank has contributed to settling water conflicts. In 1960, Pakistan and India signed an agreement resolving their conflict about the Indus River. More recently, the World Bank helped bring together the ten Nile Basin states in a dialogue. While transboundary rivers may cause conflicts, they can also catalyse cooperation.

What are the prospects and risks of private water supply?

More than 95 percent of the world's population are supplied with water by public utilities. This situation is probably not going to change dramatically. Given the frequently very poor services in developing countries, various options for private sector participation ought to be investigated. Management contracts reduce the risk for the private sector and bear a high potential for improved performance over a short period of time. Often, however, such contracts are not sustainable. Concessions cover longer periods and mobilise private investment capital while asset ownership remains public, but the international private water companies have only shown limited interest in them. The main reasons for this are unstable framework conditions and a lack of political will to increase tariffs. The full privatisation of water utilities via the sale of assets, although commonly associated with private sector participation, is actually very rare.

How can the risks be reduced?

Contracts have to be awarded after competitive bidding, and performance standards and tariffs have to be clearly prescribed and objectively monitored with the aid of independent consultants. This is only possible if there are realistic expectations on both sides and if pragmatic decisions are made. Where this is not the case, a mutually beneficial participation of the private sector will remain a pie in the sky. However, in the unfavourable political and societal conditions that prevail in most developing countries, public utilities usually have even poorer prospects of becoming more efficient.

Manuel Schiffler was interviewed by Jochen Renger, Planning Officer "Water Policy and Water Resources Management"

A round table for river basins

Conflicts can easily arise where there is a scarcity of water or where it has been unfairly distributed by humans or by nature. Already, the World Water Council has postulated a world water crisis. But water shortage is not so much the reason for this threat. Rather, it is due to bad management, according to the World Water Vision report.

Wolfgang Köhler, text
Manfred Scholaen, photos

The Scientific Advisory Council to the German Federal Ministry for Economic Cooperation and Development (BMZ) concludes that the situation requires "structural reform in order to achieve a more effective, efficient and nonetheless socially balanced and ecologically compatible water supply in developing countries".

Again and again, there have been conflicts about water even in regions without an acute shortage of this vital resource. For example, when the Second World War was over, the Netherlands complained bitterly about the pollution of the Rhine. The high phenol and salt content of the Rhine's waters created difficulties in water supplies to wide areas of the country. Since the water of the Rhine was heavily polluted when it reached the Netherlands, the Dutch became aware at an early stage that water protection is an international task. This is why they set up an international forum as early as 1950 in order to discuss, among other issues, the pollution and purification of the Rhine with Germany. And all this happened at a time when the aftermath of the Second World War was still causing considerable distress. Nowadays, dialogue between the riparian countries of the International Commission for the Protection of the Rhine is so well established that any need for regulatory measures has long vanished from public awareness.

There is also a need for a regulation of access to water and its distribution in other parts of the world. For example, this is the case on the Nile, the world's longest river. It influences the lives of around 160 million people in north-eastern Africa. The Nile Basin links up ten riparian countries. From its southernmost tributary, the Kagera River in Rwanda, to the Nile Delta in Egypt, the river system covers a route of 6,700 kilometres. A sustainable management of the water resources and a systematic promotion of strategies to avoid conflicts in the water sector have an immediate impact on consumers: both on their quality of life and on the livelihoods of the

typically rural population in the Nile Basin, for whom water is a vital means of production.

The Nile could be used to a greater extent to generate electricity, grow food, carry goods and develop industry. But it is also very important to protect the river system from pollution. The Nile could have multiple beneficiary water uses. And there is large potential for sharing benefits. Commissioned by BMZ, the GTZ is supporting cross-border water resources management and institutional capacity-building in the riparian countries of the Nile. Effective guidelines for integrated water resource management have to be co-ordinated, formulated and implemented. And then there is a second, no less ambitious development project: Technical Cooperation with the River Basin Organizations of the Southern African Development Community (SADC) for the Limpopo and the Orange-Senqu.

A historic lifeline. From time immemorial, water has been an essential means of production for the people along the Nile. The riparian states ought to make use of this resource to their mutual benefit.

In Southern Africa, there are 15 river systems that cut across borders. Thirteen of them touch on the SADC member countries. Over the last few decades, there have been numerous bilateral and multilateral water agreements. Moreover, with the Limpopo Basin Permanent Technical Committee (LBPTC) and the Orange-Senqu River Commission (ORASECOM), the SADC has two organisations that can take action to ensure cross-border management of water resources. Nevertheless, the central problems still remain essentially unsolved. The inhabitants of the river basins do not have equal access to water, and the institutional regulations on the peaceful settlement of water disputes are flawed.

This is why hopes are high regarding the success of GTZ´s support.

One project and ten partners

A number of hurdles had to be cleared as a preparatory measure. "The institutional structure of development cooperation is traditionally geared to bilateral projects," says GTZ´s Programme Manager

Thomas Schild. For a project to be supported, there has to be a local implementing organisation. It may be one of the respective country's institutions or organisations, its government or an international organisation. Within the Nile Basin Initiative, GTZ is working together with the governments of nine riparian countries. Eritrea, the tenth riparian, has an observatory status. An international Nile Commission with an international legal status that could act as a regional project partner is yet to be created.

Technical Cooperation in the Nile Basin is aimed at contributing to initiating sustainable, socio-economically balanced development by using common water resources fairly. A strategic action programme supported by the World Bank, UNDP and a number of donor countries is to put this vision into practice. One central element of this joint initiative is Technical Cooperation aimed at establishing capacities without frontiers. GTZ wants to fulfil its mission swiftly and unbureaucratically and, once again, do justice to its reputation of being an internationally experienced advisor on development issues.

Cooperation requires knowledge

Ten years ago, six Nile riparian countries formed the Council of Ministers of Water Affairs of the Nile Basin States. A second body, the Nile Technical Advisory Committee, was entrusted with the task of developing an action programme for water management along the Nile at the time. In 1997, the World Bank assumed the co-ordination of the procedure, which evolved into the Nile Basin Initiative (NBI) in February 1999. The NBI aims to achieve sustainable socio-economic development by ensuring that the common water resources of the Nile Basin are used fairly.

A strategic action programme for the Nile is to help develop the common vision. The programme also covers environmental management, the energy industry and agriculture. At the first meeting of the international consortium for cooperation along the Nile, the Nile Basin Initiative and the World Bank presented the action programme to a larger group of potential donor countries and drew up a list of requirements for international financial support. Since the Nile Basin states are unable to finance the action programme on their own owing to the precarious financial situation of their governments, the conference approved 74.5 million dollars in June 2001.

Germany's contribution to the planning and management of water resources above all focuses on training and upgrading of specialist staff and on supporting a suitable institutional set-up. Water authorities, water industry companies and consumer groups expect the transfer of international expertise to result in acquiring know-how of their own. The development of organisations with regard to the management of the respective river area, the setting up of data banks, information and knowledge management, negotiating skills, crisis management and technical support in specialist issues are at the forefront of efforts being made. Once the regional and international institutions have been thus qualified, they are to seek and try out suitable forms of cooperation.

Water management. Along the Nile and in Southern Africa, GTZ is supporting the efforts of the riparian states to develop a common language.

This will not be easy for the development enterprise. All forms of water policy affect vital interests of the countries concerned, the governments of which are not always on friendly terms. If the resource is to be distributed and used more fairly, the users must be able to have a say. Specialist competency has to be established and extended, and local, regional and transnational partnerships need to be formed. This requires trust that has yet to be created. After all, the aim is to contain and manage potential conflicts.

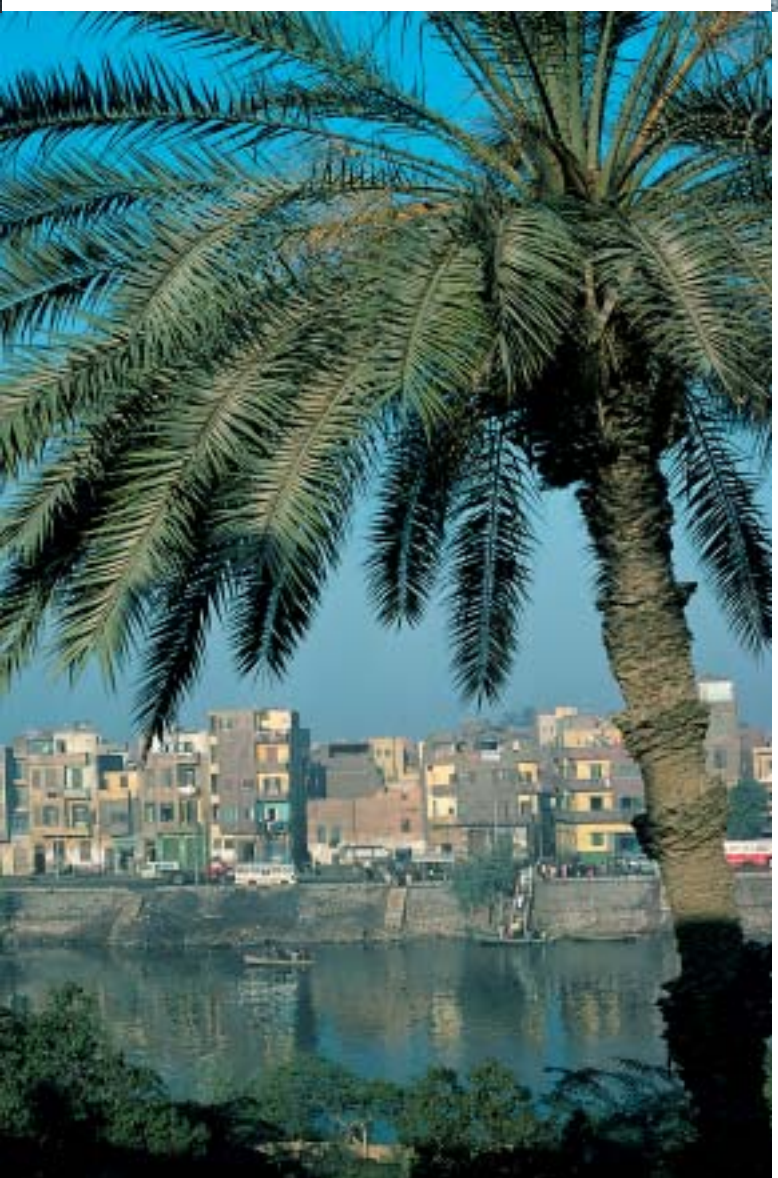
Pooling expertise and upgrading staff

These issues are being addressed in different ways on the Nile and in Southern Africa: by the Council of Ministers of the Nile Basin and SADC member countries, the river basin organisations of the Limpopo and the Orange-Senqu, the Nile secretariat and the organisations and associations of the user groups. In parallel, GTZ helps to set up pools of advisors and think-tanks comprising top-ranking scientists and practitioners. Their expertise aimed to support the respective commissions in institution building and in the training and upgrading of specialists.

However, swift and immediate effects of Technical Cooperation on water management on the Nile cannot be expected. As a first step the formulation of guidelines on joint water management has to be achieved by an international dialogue. Specialist symposia in which politicians, scientists and practitioners of water management can exchange experience and practice in river basin management are central elements of water management on the Nile and in Southern Africa. Training and upgrading programmes are being run for the specialist staff

in the countries involved and for the participants in the discussion processes. Specialists are advising local stakeholders on compiling studies and establishing data banks to monitor river basins. Efforts are being made to integrate European scientists and practitioners into the process, including experts from German water industry associations or the Rhine Commission. They can offer a wealth of experience.

One particularly important lesson that has to be learnt is that water management takes time. With this insight, the members of the Rhine Commission can certainly put a damper on any all too high expectations of problems being solved swiftly. Establishing cross-border water management in Central Europe did not make any rapid progress either. Thirteen years passed after the initiative of the Dutch to set up a forum to deal with common problems along the Rhine before the agreement of the Rhine riparian countries on the International Commission for the river's protection was signed. ■



Building strong institutions

A few years ago, the 13 member states of the Southern African Development Community (SADC) signed a Protocol on Shared Watercourse Systems. On this basis, river basin commissions are to be set up for river basins of a cross-border nature. A commission of this kind already exists for the Orange-Senqu Basin. There are plans to upgrade the technical committee for the Limpopo into such a commission. The two river basins are the lifelines for around 15 million people in Southern Africa.

But this alone will not solve the distribution and usage problems. South Africa, whose gross national product corresponds to the sum of those of all the other twelve SADC countries, substantially regulated in the past water supply according to its own needs. Moreover, as a riparian country of the upper reaches of the river systems, it is in a strategically favourable position. Since the nineties, the country has entered into a dialogue with its neighbours.

GTZ supports the Limpopo Basin Permanent Technical Committee (LBPTC) and the Orange-Senqu River Commission (ORASECOM) through capacity development to establish a system for integrated water resources management. In addition, the staff of the SADC Water Sector Coordinating Unit are being trained and upgraded to ensure that they can manage the SADC water sector in an effective manner. GTZ specialists are offering advice, providing independent expertise and running specialist symposia.

Reservoirs to safeguard livelihoods. A dam near the Tunisian city of Sidi Salem.

On the way to better dams

Dams are an important option for the development of many countries. However, building them inevitably seems to result in conflicts. How can protagonists and opponents be done justice? The principles of the World Commission on Dams point to a way out.

Frauke Neumann-Silkow, text | Hacky Hagemeyer, photos

Large dams are causing conflicts world-wide. While their protagonists point to the enormous development prospects dams can open up, their opponents draw attention to their social and ecological consequences. There is a growing insight that the conflicts can only be resolved by cooperating.

In 1998, the World Commission on Dams (WCD) was set up as an approach to a consensus. The WCD, a commission on which both protagonists and opponents of dams sat, was to develop guidelines and criteria for the planning of new dams. A forum comprising 68 representatives of NGOs, governments and industry acted as an advisory body. The Federal Ministry for Economic Cooperation and Development (BMZ) supported the process financially while a GTZ project made contributions in terms of contents. Commissioned by the BMZ, and together with the WCD, GTZ worked out the concept for twelve case studies and for a comparative analysis of 125 dams. GTZ made significant contributions to the case studies of Pak Mun in Thailand and Tucurui in Brazil.

Expectations were high in terms of what the WCD could achieve. Proposals for a legally binding orientation framework were desired. The operating companies were at last reckoning with planning and investment security for the future. Even a system for the certification of so-called good dams was being discussed. Lasting

protests among the population had led to costly planning delays in many cases. More and more frequently, creditors and investors are withdrawing from planned constructions for cost and image reasons. German companies, some of which have been provided with government export credit guarantees, so-called "Hermesbürgschaften", are also involved in controversial dam projects.

Basic values for the future

After two-and-a-half years of work, the result was presented. On the basis of an extensive analysis of whether, how and why dams have fulfilled their development objectives, the WCD formulated the basic values, the strategic priorities and 26 guidelines for future water and energy planning and dam construction. The five core values are: equity, efficiency, participatory decision-making, sustainability and accountability. The strategic priorities linked with these requirements call for public acceptance and a comprehensive options assessment process during the early planning phase, including upgrading of old dams as an alternative. Further demands made by the WCD are the conservation of river ecosystems, a fair distribution of the benefits of dam projects, compliance with agreements and transboundary cooperation.

The WCD report offers a basis for a new drawing up of planning and project cycles. In a nutshell, the report demands that in future, energy and water projects be placed in a wider development context. The knowledge and understanding of all stakeholders regarding the use and impact of large-scale dams has to be consulted before decisions are taken on building the dams. Social and ecological criteria need to be considered on a par with technical and economic aspects. If a dam does appear to be the best solution to a problem, negative accompanying factors need to be appropriately compensated for.

The analysis of the World Commission on Dams demonstrates that in spite of the significant positive contribution that many dams make to economic development, a remarkably large number of dam plants fall far short of the predicted economic and technical performance. On average, the construction costs were 56 percent above the original budget plan. Several parts of the report show that a regional development concept based on a comprehensive socio-economic analysis and coordinated with the population could have reduced scepticism towards dams. These omissions, the economic miscalculations and insufficient compensation have provoked and aggravated conflicts with the affected people.

Accepted priorities

The report met with a mixed response. Bilateral donors and development banks including the World Bank demonstrated their approval in principle of the WCD's basic values and strategic priorities. However, there has been considerable opposition from some of the dam countries such as China or Turkey. Above all, the report's far-reaching demands for participation of the population have been viewed with scepticism. Indigenous communities that are affected by resettlement measures are even granted a right of veto by the report.

One shortcoming of the WCD report is that it lacks good examples demonstrating that significantly improved dams are quite feasible. The proposals have to mature in practice. The Dams and Development Project (DDP), the WCD's successor organisation, aims to introduce its predecessor's strategic priorities and core values to dam practice at national, regional and local level. The DDP is advised on the issues it deals with by a Steering Committee. The BMZ represents the bilateral donors with its seat in this advisory committee. A DDP forum consisting of around 100 representatives serves as a discussion platform and a link to the public. The first major task of the Dams and Development Project will be to reintegrate the opponents of the WCD.

Conceptual pioneering work

GTZ is making its contribution to putting the far-reaching recommendations of the WCD into practice. To this end, a GTZ project is developing and testing practical methods in cooperation with national and international players. The important topics here include resettlement, participation in project planning and the development of controlling and financing instruments. In the partner countries, dialogue processes are supported that culminate in national recommendations.

The project draws on the wealth of experience that GTZ can boast. Much of this experience coming from development cooperation can be transferred without difficulty to issues the construction of a dam raises, such as resettlement and regional development, conflict prevention, consultancy on energy and water policy matters or environmental management. Here, new fields of activity are emerging for the future in terms of Technical Cooperation, including services for private contractors.

Platform talks of the BMZ continue the dialogue on the WCD recommendations at national level. GTZ and the Kreditanstalt für Wiederaufbau (KfW) are involved in organising the dialogue forum. In this committee, around 30 experts exchange their opinions on the proposals of the former WCD, including representatives of NGOs, the Hermes Kreditversicherungs AG (German export credit agency), the construction industry and the ministries. The results of these talks can be of particular use to activities in Asia, Africa and Latin America. For these region bear the biggest potential to build damming plants.

In spite of all the criticism it has been confronted with, the World Commission on Dams has provided an excellent toolbox for the construction of better dams. It is up to development cooperation to test and make use of this toolbox in practice with a view to socially compatible and ecological dam construction. There is no doubt that dams are important. On a world scale, today's dams secure up to 16 percent of food production. Twenty percent of the world's energy is generated with hydropower, with 24 countries, including Brazil, the Congo, Zambia and Norway, covering more than 90 percent of their energy demand with hydropower. Dams are an important development option. ■

The author works for the GTZ sector project for the implementation of the recommendations of the World Commission on Dams.

Unintentional pioneers

In the Jordan Valley, salt is the enemy of agriculture. There is too much of it in the brackish water that the people have to rely on. Every farmer therefore has his own way of trying to cope with the rising salt content. A Jordanian-German Brackish Water Project is supporting cultivation experiments and is disseminating experience gained to as wide an area as possible.

Andrea Nüsse | text and photos

Abu Rushd is sitting in the shade of a eucalyptus tree. The aged farmer with his deeply lined face looks across his fields in the Jordan Valley. In the background, the engines of the two diesel pumps that fetch the water from the Jordan River to his fields are chugging away. There is no water shortage yet, although the river is more of a rivulet in the summer. The problem is the salt in the Jordan's waters.

The salt content of the water is rising annually. The reason for this is the constantly dwindling outflow from Lake Genezareth, which Israel has been taking water from in abundance. In addition, more and more drainage water with an increased salt content is flowing back into the river in the northern Jordan Valley. This is why Abu Rushd and his two sons Mirshid and Nasser have long been unable to grow tomatoes. The loss of profit would be too great, for tomatoes are sensitive to salt in the water. Abu Rashd also had to cut down the lemon trees years ago. He left one standing in the middle of a field to remind him of better times. Now he is experimenting with vegetables and grain varieties that can withstand the constantly rising salt content of the water. But this has turned Abu Rushd into an unintentional pioneer.

The Jordanian-German Brackish Water Project has been supporting this farmer with his experiments since 1997. The GTZ staff of the project evaluate the experience and experiments of Abud Rushd and compare them with results gained in international research. Other farmers are to benefit from this knowledge. So far, around 600 out of the 6,000 farmers in the central and southern Jordan Valley have been using brackish water from wadis, wells, springs and the Jordan River itself. One in four of these farmers has no access to the public freshwater supply. The government authority for the development of the Jordan Valley, the Jordan Valley Authority (JVA), is pumping more and more water from the King Abdullah Canal to Amman, where the demand for drinking water among the growing population and industry's water consumption have constantly been increasing. As a result, the JVA already drastically reduced water supply to the farmers on June 1st. For farmers with fruit plantations, irrigation was cut to just 60 percent. In order to reduce water consumption, the authority takes around 1,000 hectares of land on lease and leaves it fallow.

Individual experiments

The construction of desalination plants would not pay its way for most of the farmers. Such plants are only interesting for the large-scale landowners who grow, for example seedless grapes or baby leeks for the British store Harrods. The other farmers cultivate an average three hectares of land, and like Abu Rushd, they experiment on their own initiative. Drop irrigation with dripper systems has been extended. Many farmers use plastic covers to minimise evaporation. Intensive irrigation in the winter, when enough water is available, washes the salt into deeper layers of the ground where it can no longer reach the roots of the plants.

Abu Rushd does not want to rely on just one crop. "If I have a monoculture and the prices collapse, the financial risk will be too great," says this Palestinian, who was expelled to Jordan in 1973. He first tried his luck with wheat, but he was not satisfied with the harvest. This year, he planted melons in a corner of one of his fields for the first time. They still look nice. But Abu Rushd fears that they are vulnerable to disease owing to the high salt content of the water and the soil. However, this summer's big hit is the muluchia, a jute plant the green leaves of which are prepared in a similar way to spinach. This plant, which is very popular in Egypt, only became a big seller in Jordan last summer. Muluchia will tolerate brackish water and the summer sun. It is harvested after 45 days and can be sold at a good price.

Tips via the Internet

Mansur Shihab has also found his favourites. Since last year, he has been growing lucerne in his fields. It is sold as animal fodder. He harvests 18 tons a month in his field. These fodder greens are selling well, up to now they have usually been imported from Saudi Arabia. The GTZ staff obtained information about lucerne via the Internet. Mansur Shihab irrigates with freshwater first and later, when the plant has become less sensitive, with brackish water. This method has proved useful. He is currently trying another one:

irrigating alternately with fresh and brackish water on a daily basis. This method offers another benefit. The salt, which inhibits growth, is washed into deeper layers of the ground.

Partners of the farmers

However, his success is under threat. The government water authority has built a new desalination plant upstream from his fields in order to purify well water as drinking water for Amman. Mansur Shihab fears that the government wants to save and therefore intends to make do without the construction of a pipeline for the salty wastewater, which would then flow straight into the wadi he pumps his water from. "That would be a disaster!" Shihab says. The farmers in the vicinity have already protested against the measure with a petition. At a meeting with representatives of the Water Ministry, the farmers were promised that they "would not be harmed". This will not do for Mansur. He has had sleepless nights on account of his investments. And he hopes that the GTZ staff and their local partners will see to it that the farmers obtain a hearing from the government. In talks at the Water Ministry, the project members were promised that the government would build an additional pipeline for the wastewater.

In spite of all the problems, the situation of the farmers in the Jordan Valley is not hopeless. "The strongly salty drainage water does not have to be pumped away but flows into the natural depression of the Dead Sea, which can do with every drop," says GTZ staff member Andreas Kuck. It usually rains sufficiently in the winter. The soils are chalky and retain their structure in spite of the high salt content. This is why even carrots and potatoes will grow in the Jordan Valley. "According to international literature on brackish water they shouldn't really be growing here," Kuck explains. In order to extend the scope for cultivation experiments, GTZ staff member Artur Vallentin consulted two research centres in Latin America: the international potato centre in Lima (CIP) and the International Center for the Improvement of Maize and Wheat (CIMMYT). From there he receives plant and seed samples of varieties that may be particularly resistant to salt. The plants are currently being bred in laboratories and on trial plots so that they can be planted in the next season.

Cooperation between the farmers and the GTZ team is working out well. "After all, we didn't have to persuade the farmers to use brackish water. That is their own initiative, even if it is the result of an emergency," says Andreas Kuck. What is lacking, however, is cooperation among the farmers themselves. Experience made in using brackish water is not shared. For example, Mansur Shihab, the "King of the Lucerne", doesn't want to pass on his recipe for success to the neighbouring farmers. He keeps a jealous eye on the market niche he has discovered. Abu Rushd hopes that the GTZ staff will one day present him a "wonder plant" that he can cultivate with a high yield. But the goal of the Jordanian-German Brackish Water Project is not that of obtaining a wonder plant for each farmer. The gathered and evaluated data are to be made available to as many farmers as possible. ■

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Supplement on freshwater

The situation. Owing to the strongly increasing demand for drinking water and water for industrial use in Jordan, tapping and developing new, additional water resources is a top priority.

The goal. Farmers in the Jordan Valley are to be enabled to use weakly saline surface and groundwater as well as treated wastewater in a sustainable manner.

The concept. GTZ is supporting concepts for the agricultural use of marginal water resources and contributing to implementing them.

The partners. The Jordan Valley Authority.

The costs. The BMZ is supporting Technical Cooperation in using brackish water with around 2.75 million euros.

Task of the century:

Water for everyone

Water is life. Wherever this resource is in short supply or is lacking altogether, development will stall. This issue, with all its facets, has always been at the top of the agenda for GTZ. Technical Cooperation supports infrastructure and the water industry and helps to find international guidelines for the use of water.

Stefan Helming

Water has many facets. Water is nourishment, an economic good and an indispensable production factor. In addition, water is a social good. Rivers, groundwater and ecosystems link up the people. However, water is not inexhaustible. Since this resource is being used more and more intensively, the problems are growing.

The International Freshwater Conference in Bonn in December 2001 demonstrated the volatile aspects. Nearly every sixth human being in the world cannot satisfy their basic needs because they have no access to clean water: neither for drinking purposes, nor for cooking. Every third person has to make do without hygienic toilets. Day by day, 6,000 people die of diseases transmitted by polluted water. The next big problem is that the scarce water supplies world-wide are rapidly being depleted in many regions. Sewage from industry and agriculture is contaminating rivers and groundwater, especially in the industrialised countries and the fast-growing take-off countries. And the scarcer water becomes, the more there are conflicts about access. There is even talk of wars about this resource. Meanwhile, agriculture world-wide is using up three-quarters of the water humans take from the natural cycle – frequently with a low level of efficiency. Floods and droughts round off the problem scenario. Many natural disasters appear to be a consequence of using water in the wrong way and a mismanagement of this resource. The poor are especially hard-hit. They are in the least fortunate position to take precautions and protect themselves.

Three major tasks arise for GTZ from all this. In Technical Cooperation, the infrastructure has to be improved so that people can make better use of the water. This implies better water supply and sanitation in settlements, agricultural irrigation and the construction of dams that are adapted to their environment. The second important issue development cooperation has to address is the sustainable management of water resources. Water deposits have to be shared among the sectors and users, rules governing access have to be worked out, and the protection of water deposits against pollution and overexploitation has to be ensured. GTZ is supporting the development of international rules and agreements. GTZ offers specialist, process and policy consultancy for all these aspects. Government institutions, private industry and the self-organisation of the people affected are to join forces. What counts is enhancing the efficiency of people and organisations, for example with training and upgrading as well as by promoting development organisations.

Reforming the water sector

In several countries, GTZ is developing programmes for a reform of the water sector in collaboration with the Kreditanstalt für Wiederaufbau (KfW). The GTZ staff are advising partner governments and other important stakeholders on political and organisational reforms. One major objective is to transfer responsibility from the national to the local level and make utilities more economical. Frequently, this also includes an internal reorganisation of the companies, for example in terms of financing or staffing. KfW is accompanying the reforms by providing funds for investments in infrastructure.

In rural areas and in many urban districts, hardly any local government structures are in place. Here, the water committees and self-help groups have proved useful. Usually, women are active in them. In the large cities, relatively costly technical plant is required for water supply and sanitation. Since the untreated water is polluted, it has to be treated. Drinking water supply requires a network of mains. This cannot be accomplished with self-help alone. Professional supply structures have to be established, both government and private ones.

as such are necessary! Rules for good water practice are not easy to formulate and agree upon, let alone apply and enforce. The provisions made in this respect in the German Water Resources Act are as follows: "Bodies of water are to be treated as an element of the cycle of nature, and are to be safeguarded as a habitat for animals and plants. Their management is to ensure that they benefit the wellbeing of the public – and, in harmony with the public, the individual – and that avoidable interference with their ecological functions does not occur." On an international

GTZ has two tasks in the water sector. First of all, the water sector has to be improved. This means seeing to better water supply and sanitation, agricultural irrigation and the construction of appropriate dams. The second important objective is the sustainable management of water resources. Water deposits have to be shared among the sectors and users, rules have to be worked out for access, and water deposits need to be protected against pollution and overexploitation

In developing and take-off countries, private enterprises have the potential to offer three advantages in comparison to government or local government institutions. They can raise capital for investment, frequently, they are in a better position to attract and retain qualified staff, and to a certain degree, they are independent of political interference. This is how supplies were made significantly more secure for poor people in the slums of El Alto in Bolivia's capital, La Paz. On the other hand, experiments with water markets world-wide have not been too promising as yet. The reason is that water as such is not a commodity and has no price per se. But treating, storing and distributing water costs a lot of money. Nevertheless, many politicians are opposed to water rates. Either they promise water free of charge because they want to be re-elected or they fear that many poor people will not be able to afford water if there is a price to pay for it.

However, the well-meant policy of low water rates completely misses its target. A closer look reveals a disastrous effect. The rich have good water, but they do not pay for it. The poor have miserable water supplies, for owing to a lack of income, the water utilities cannot extend their services. As a result, the poor have to buy their water at excessive prices from mobile water vendors. This is why Technical Cooperation insists that cost-covering rates be charged. Rate regulations can grade rates so that consideration is given to the poorest of the poor. But water rates

scale, we speak of integrated water resource management. This is a politically oriented approach that intends to consider water use in households, agriculture, nature and industry as well as the respective administrations and interest groups.

Making management more efficient instead of tapping new sources

Above all, the emphasis has to be on once again making respect for nature and water resources the starting point for water management. Instead of constantly looking for new sources of water, what should be at the forefront of all attempts to ensure better use of water is the question as to how water resources that have already been tapped can be made use of in a better, more efficient and more socially balanced way. For every new source that is tapped will be more expensive than the previous one, create more problems for the environment and increase the threat of conflicts with neighbours. This is also the reason why many people are demonstrating in Spain against the national hydrological plan, which is aimed at diverting water for irrigation on a large scale from the centre to the dry Southeast. And many practitioners and scientists have their doubts as to whether the massive Three Gorges Dam project in China really is the ideal solution. Before a new dam is built to supply a major city with water, GTZ advisors recommend a meticulous public assessment of whether it would not be more favourable to transfer the

water rights from agriculture to drinking water. However, one has to be cautious here. Many large-scale hydrological projects have also proved to be very useful. In Germany, nobody would demand that the country's dams be dismantled, not least of all since the lakes that have developed have a positive impact on the environment. Today, the Aswan Dam on the Nile in Egypt is also given a mainly positive appraisal.

Everyone has to be involved in water management. No doubt it is up to the government to set the frame for water management and, setting out from the concept of sustainability, establish and enforce rules and regulations. However, the primacy of politics must not result in a dominance of experts and technocrats in public administration. The new European guidelines, which are now also being implemented in Germany, demand an intensive participation of citizens in new projects. Integrated water resource management reaches beyond administrative and state borders, encompassing the integration of groundwater, surface water, land use and water management and the integration of the interests of cities, industry, agriculture and nature conservation. The German Federal Government is increasingly commissioning GTZ as a specialist organisation for international negotiations dealing with water issues. In December 2001, the Federal Government staged the Bonn Freshwater Conference in close co-ordination with the United Nations. GTZ provided the secretariat for this conference. The meeting was intended to draw up recommendations for the practical solution of water problems world-wide and formulate messages for the forthcoming World Summit on Sustainable Development in Johannesburg. Delegates from 118 governments, 47 international organisations – including the UN and the EU – and 73 organisations representing various groups in society took part in the freshwater conference. The key recommendations for action, the so-called Bonn Keys, as well as further information on water are in the Internet at www.water2001.de.

One of the conference's good messages for the World Summit was that the global water problems can be solved. The concepts and methods required are available. The bad message was that massive political reforms are needed to implement the concept of sustainable development in water management. ■

The author is former Director of GTZ´s Water, solid waste management Division and now Director of the Mediterranean Region and Middle East Division.

Tackling Algeria's perennial water crisis

Integrated management of scarce water resources in Algeria – a precondition for future economic development

Siegfried Holtkemper, text
Bärbel Högner, photos

Soon after their arrival, a foreign visitors to Algeria will notice the problems in the country's water sector. In Algiers, the capital, they will be surprised to find out that water is supplied only once every three or four days. Most probably, no other capital in the world suffers such acute water shortages. Especially in the outskirts, they will see the large number of trucks with water tanks delivering water to households, shops and restaurants – a sure sign that the normal distribution system does not work. Taking a stroll along the beach, the visitor will smell the wastewater that is flowing into small riverbeds and on to the beach, ultimately reaching the sea. A layer of algae covers the water surface of the shallow shores.

Algeria is one of the richest countries in the world as far as its natural resources are concerned - with one notable exception: water. But this is neither a sufficient nor an acceptable explanation for the problems referred to above. In neighbouring Tunisia, the water resources per capita are just as scarce as in Algeria, but there are no significant supply or pollution problems. The chief shortcomings in the Algerian water sector are of an organisational and managerial nature. The scarcer water resources are, the better their management has to be. The resources have to be protected from pollution, and the distribution infrastructure has to be effective, efficient and well-maintained. Furthermore, consumers have to make an effort to reduce their consumption wherever possible.

The continuous shortages in water supply (especially in the big cities) are caused by a series of management deficits in the country and aggravated by recurring droughts. Algeria does not have a lack of financial resources thanks to its comfortable receipts from oil exports. Considerable investments have been made in infrastructure in the water sector. Dams and transfer pipelines have been built, and scores of wastewater treatment plants have been constructed – but to no avail, as it would appear. The water distribution and the sanitation infrastructure is subject to severe deterioration, and most of the existing wastewater treatment plants are not in operation, with the result that the pollution of water resources continues to reach critical levels all over the country.

Modernising water management

Algeria is a country in transition from a former centrally planned economic system to a market economy. This transition has created a number of deficits, especially in the legal and institutional framework, because the old set-up has become obsolete and new rules are not yet fully in place and not yet implemented. In addition, inflation and devaluation of the national currency have shaken the refinancing basis of public utilities. So there is considerable pressure on institutions to change and adapt to the new environment. In the water sector, this pressure is much higher than in other sectors, because it is increased by the scarcity of the resources, population growth and industrialisation.

The present institutional framework is therefore insufficiently structured and hardly conducive to efficient planning, investing in and operating of hydraulic infrastructure. There is no clear division of responsibilities between different institutions, resulting in a foggy institutional landscape and accountability that is not well-defined. In general, institutions in the water sector are overwhelmed by the tasks assigned to them.

Faced with a steadily deteriorating situation in the water sector, the Algerian Goverment has responded with a vast modernisation programme. The new water code of 1996 sets the framework for a fundamental restructuring and reorientation of the sector.

German Technical Cooperation is supporting the modernisation programme on a large scale. It's not primarily financial assistance that this modernisation process needs, it's mostly technical expertise and advice on constructing a new institutional set-up and initiating much needed organisational development. A team of experts from GTZ is providing advisory services in various fields to the different institutions both at national and local level. The German assistance is an integral element of the water sector reform process. It is or-

ganised as an open programme with at present five subprojects located in key areas and with high impacts on structure building and decentralisation.

Assessing available water resources

Water sector management can be described as the constant balancing of available resources and needs by the responsible institutions and organisations and the provision of all users (households, industry, agriculture) with the quantity and quality of water needed under the given constraints and taking economic and social priorities into account.

The basis of any water management system is the evaluation and assessment of available water resources. You have to know what quantity of water is available where and during what period. Is it a renewable resource (a river for example) or a non-renewable fossil aquifer? What are the dangers of pollution?

Before and after. The postcard this Algerian holds shows the beach in bygone days. Owing to high pollution levels, a sign nowadays says that bathing is forbidden.

The daily nuisance of water shortage. Housewives like Hamida Karima fill their reserve canisters to the brim if the pipe does happen to yield any water.

Pressure is building up from all sides on Rachid Taibi, General Director of the Water and Soil Resources Agency (Agence Nationale des Ressources Hydrauliques – ANRH), to provide reliable data and information to planners, operators and decision-makers in the water sector. The quality of the planning and decision-making process in the institutions of the water sector can only be as good as the information on water resources provided by Taibi's agency. There is a lot of data in ANRH, but it is scattered about in different "corners", partly on paper and not yet processed, and partly in several non-compatible databases in different information systems, with duplications, overlapping and various kinds of inconsistencies. Data, the agency's one and only one asset, presents itself as a fragmented collection of unorganised data deposits that may sometimes even be data cemeteries. So there is a lot of data, but only little information. Only when data – the measured values at all the hydrometrical, hydrological and hydro-geological observation stations in the country – is being checked for errors, archived in an organised and integrated way, processed and aggregated according to the different needs, does it become useful "information" for the users. But in the present situation, the agency is no longer able to serve its clients. It has lost its role as the informational and methodological foundation of the water sector.

Mr. Taibi has a vision. He wants to transform his agency into a modern service provider for the water sector offering a wide range of high quality "products" (time series of hydrometrical and meteorological data, maps, bulletins, studies, etc.) both to public and private institutions as well as the public at large.

So he invited GTZ to carry out a full analysis of the existing deficits, develop a plan for the modernisation of his institution and assist him in its implementation. The organisational analysis carried out by a group of experts specialised in the different professional fields of the agency followed the "product approach".

Integrated water quality management (wastewater)

A few figures suffice to describe the alarming state of wastewater management. Sewage from less than one percent of the population is being treated and purified, while 350 km of the 1,200 km coastline is heavily contaminated, including more than 75 percent of the urban coastline.

Frank Sperling of Emschergenossenschaft/Lippeverband (EG/LV) is heading a team to set up a sustainable sanitation and wastewater management system. Sperling prefers to call it a water quality management system, because its final objective is the protection of the quality of water resources. EG/LV is a river basin agency in Germany's largest industrial area, the Ruhr region. It can offer more than 100 years of experience with integrated water quality management, and Sperling wants to transfer some of this experience to Algeria. "In our agency in Germany we made a lot of mistakes, and we have learnt from them. I want to help the Algerians to make fewer mistakes than we did," he says.

Together with his Algerian partners in the newly established National Sanitation Authority (Office National d'Assainissement – ONA), Sperling has developed a concept and a strategy for the reorganisation and establishment

of a wastewater management system in the country. A further concept is being developed for using the potential of reusable wastewater in the water balance. This would act as an additional driving force for the extension of wastewater infrastructure.

Further areas of water sector modernisation

Water resources assessment and wastewater management are only two "construction sites" of the ongoing modernisation process in the water sector where GTZ provides assistance. At present, there are three other major "construction sites" and several smaller ones.

In the drinking water supply sector, support focuses on one regional water supplier. In Tlemcen, Siegfried König and his team are assisting the Tlemcen Water Authority in increasing its financial and entrepreneurial autonomy. They have started to implement an integrated organisational development model with a focus on customer orientation, management information systems and human resources development.

The establishment of an integrated system of information management at sector level is a horizontal task involving all institutions of the sector. The goal is to construct an integrated system of work organisation, data flows and informational aggregation that provides information needed to all user groups concerned with water management.

So far, a Master Plan for Information Management defining the overall framework and objectives for the development of information in the water sector, the organisational and information technology (IT) architecture as well as the implementation approach and procedures has been prepared by a joint German-Algerian team. The model chosen is based on decentralisation of data collection, quality control, archiving and processing leading to the establishment of institutional data banks which are linked by a sectoral Intranet. The implementation process has been launched with the establishment of selected information subsystems and the build-up of the IT infrastructure. Major efforts are being made to guarantee the uniqueness and authority of data sources.

The Regional Water Master Plan will be an integrated long-term planning framework for the development of the hydraulic infrastructure and water consumption patterns with the aim of balancing available resources and demand.

Such a complex modernisation process requires a strong co-ordinating structure. Cherif Khammar, Secretary-General of the Ministry of Water, assumes this role for the Algerian side, and Dieter Gomer, GTZ special water sector co-ordinator, is his counterpart for the German side. Together, they form the core of a steering committee orienting, guiding and supervising the process of change. They define the goals and agree on priorities, discuss strategies and implementation issues and try to remove obstacles so as to clear the road for the modernisation teams.

Dieter Gomer also maintains close links with the Ministry of Finance, where Said Bouali, chief budget planner for the water sector, is his main interlocutor. Together they are looking for possibilities to improve the financing systems in the water sector, which are always a combination of tariffs and different types of subsidies. Sometimes there is too much money in the wrong place and almost nothing where it is needed, because the traditional budgetary structure is very rigid. It is the technical system that defines the financing needs, and these have to be covered in order to guarantee that the system operates smoothly. And money is not in short supply in Algeria.

Achievements so far and prospects for the future

The project concept is based on a model for integrated water management, which is the vision behind the ongoing process of sector modernisation. The implementation approach with different specialised joint German-Algerian teams on different "construction sites" has proven to be extremely successful. These teams, which co-ordinate a number of working groups and organise extensive training programmes, have had a mobilising effect on the different levels of the institutions involved. Significant results have become visible creating further dynamics and assuring the support of the political level.

The challenge is to maintain the dynamics of the process of change and to see to it that the forces of the modernisation coalition get stronger than the retarding and backward-looking elements. This process is going to take many years, but under the present political framework the prospects for success are good. ■

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Pressure in the pipes

A household that is connected to the water mains and the sewage system is not commonplace in Bolivia. Better service has to be financed. This is not easy in one of South America's poorest countries. In Oruro, the public water utility is gathering experience with Technical Cooperation that could set the whole country an example.

Petra Schmettow, text | *Manfred Schäfer, photos*

We had a huge party. The streets were decorated, and there was lots of beer and food. When somebody turned on the tap and the water poured out, everyone cheered. I had waited for this moment for 30 years." Rojas de Frias, head of the neighbourhood council, goes into raptures when she recalls how her district in the mining town of Oruro was connected to the public drinking water mains in Bolivia's Altiplano.

The district, situated on the western perimeter of the settlement, seems to stick to the rocky hill of Pie de Gallo – an unfavourable location for mains water supply. Ms Rojas de Frias has been living here for 30 years, and in the past she had to fetch every drop of water in buckets from the district's public water standpipe three or four blocks away and carry the buckets up the steep, unpaved paths. And what is more, insufficient pressure in the mains only allowed for the water to flow from the public standpipe at night. "We had to wake each other up and would often quarrel about who had to get up and go. There were always queues. And in the winter, when you are waiting at an altitude of 3,700 metres, the cold really bites." In Technical and Financial Cooperation with the municipal water utility of Oruro, one of the worst deficiencies of the infrastructure was remedied in 1997.

A problem throughout the country

However, many other settlements in Bolivia still have poor water supplies. And yet there is enough water around. Even so, only two thirds of Bolivia's 8.2 million inhabitants have access to safe water. At least drinking water is available to 90 percent of the urban population. But in the rural communities, this share has dropped to just 39 percent.

But what is wrong with the water utilities in Bolivia? The story of the Servicio Local de Acueductos y Alcantarillado (SeLA), the public utility for drinking water supply and sanitation in Oruro, vividly illustrates the problem. All the management positions of this utility, which was founded as a public enterprise in 1974, were staffed according to political criteria. Orderly accountability was lacking entirely. There were no records referring to the regular clientele. "Invoices would go out to people who were long dead," says Fernando Zubieta, SeLA's managing director. There was no overview of costs and income. Strategic operational planning did not exist. Nobody knew what quality assurance meant. None of the inhabitants had continuous drinking water supplies. The minimum supplies were in the east of the city, which received water for just two hours a day. Owing to the large number of leaks in the mains system, losses of 50 to 60 percent had to be put up with. So not even half of production reached the users.

A dent in the finances

Towards the end of 1994, the dent in the company's finances amounted to the equivalent of about 1.85 million euros, and the crisis reached its climax in 1995. The company was on the verge of bankruptcy. "None of the local builder's merchants would deliver us material for repairs on credit. We could

no longer pay the wages. Everything was missing, even shovels," Zubieta recalls.
So the impetus for a radical restructuring of the company and the motivation for Technical Cooperation commissioned by the German Federal Ministry for Economic Cooperation and Development seem to have been a financial crisis rather than the declared goal of setting up a quantitatively and qualitatively satisfactory service. In mid-1996, the go-ahead was given for the first phase of the development project for the institutional enhancement of drinking water supply and sanitation in the cities of Oruro and Potosí. Technical Cooperation is integrated into the work of Bolivia's National Association of Drinking Water and Sanitation utilities (ANESAPA). Further utilities are benefiting from the experience of Oruro and Potosí via the Servicio de Apoyo a la Sostenibilidad (SAS), the service company for enhancing sustainability.

For a long time, SeLA played a pioneering role in the framework of the project and can now pass on its know-how to other companies. Michael Rosenauer, head of the GTZ team in the PROAPAC programme, explains the complexity of the SeLA project, which above all aims at a management reform in addition to technical and financial support.

One initial important step was to install more water meters. Now that customer files have been established, consumption and rates can be worked out with the computer. These innovations have already contributed to improvements in the company's financial situation. But the human component is what really counts. "If you consider that influential personalities try to delay or even prevent payments, it soon becomes clear that things have to change at all levels of the hierarchy," says Rosenauer. "In such a situation, a head of department must not give in but instead has to back his team and promote the new course." Unpaid bills are nothing special. Even the town administration had debts averaging 88,000 bolivianos, around 13,000 euros, a year, in spite of the fact that the Mayor is a member of SeLA's directorate himself.

Integrated throughout the country

But success in improving local water management is not enough for Michael Rosenauer. The project is to be linked up with the administrative and legal structures throughout the country. Initial experience with the need for training is to flow into the education modules of the SAS in future. In Bolivia, a law on drinking water supply and sanitation has been in force since mid-2000 on the basis of which concessions are granted by the supervisory authority for water. The basic requirement for a concession is proof of an internal management and regulatory system and an acceptable rate structure. This may sound simple, but Bolivian administration is in fact breaking new ground here. For the first time, the different parties have to mutually negotiate a balance between autonomy and control.

Rojas de Frias has a second reason to be satisfied. Better services, moderate price increases and more intensive contact with Oruro's population are ensuring the SeLA a comparatively secure position in the town's power constellation. This does not go without saying in a country in which the name of the city of Cochabamba has become an emotive word as far as water rates are concerned. Cochabamba, a town of 590,000 inhabitants that is situated in the subtropical foothills of the Andes, saw severe and violent protests towards the end of 1999 following the sale of the water utility to a private operator.

As a result, water rates increased by up to 400 percent. Privatisation was reversed. Given an average monthly income of the equivalent of 80 euros, widespread poverty and extremely different levels of income, the scope for price increases is only small. This is why the utilities in Oruro have been in close contact with the neighbourhood councils, the juntas vecinales, and are campaigning for an acceptance of the price increases of up to 20 percent.

This is how they managed to get the required consent.

So far, privatisation has not been envisaged. The management regard this as a confirmation of their reform course, and managing director Fernando Zubieta has set himself the ambitious goal of turning SeLA into Bolivia's most efficient public utility. This is not an unrealistic hope. Now, Zubieta and his four heads of department, whose positions were publicly advertised for the first time, can look back on considerable achievements. There is a register of the drinking-water mains, and over long distances, old pipes have been replaced with new ones. Water losses have now been reduced to 36 percent. New pumps have increased production, and 80 percent of all households now have a tap in their own house. By 2003, all houses are to be connected to the water mains.

"Drinking water round the clock" is what Rojas de Frias wishes for the future. According to SeLA's plans, the entire town of Oruro is to be able to reckon with a 24-hour service by 2006. Today, water is already flowing up to nine hours a day on average, which is twice as long as it did five years ago.

Nevertheless, one sore spot remains: the municipal sewage system. Just 69 percent of the sewage is collected in the cities, and only 33 percent in the rural areas, not to mention any orderly treatment of sewage. So it comes as no surprise that there is a very high incidence of diarrhoea diseases. Even by South American standards, the administering of oral rehydration salt – an indicator of how frequently diarrhoea diseases have to be treated – among just under 50 percent of all infants below the age of five is very high. Infant mortality is still at more than 60 deaths among 1,000 children.

Since 1997, a renewal and extension of the sewers has been under way under the overall control of, and largely financed by, the Kreditanstalt für Wiederaufbau (KfW). KfW would welcome responsibility for the sewage system being transferred from the municipal administration to the Servicio Local de Acueductos y Alcantarillado. Negotiations have been in progress for some time. SeLA can boast good institutional and technical capacities and could ensure sustainable operation. However, the decision is being delayed because it has not yet been settled who is going to finance maintenance costs, to what degree the municipal administration is going to participate financially and how the new service of connecting to the sewers can be adopted in the system of rates in a socially balanced manner.

The situation is dramatic. A sewage system only exists in the town centre. Some of it dates back to 1933. Sewage from 70 percent of all households still flows just about anywhere except for into the newly laid sewers. In Rojas de Frias' district, the wastewater seeps into the ground at best. Things get worse if water polluted with drainage wastewater containing heavy metals and acids from the tin mines flows through the streets and alleys and ultimately accumulates in the street market below the district. Orderly sewers do little to solve the problem because they only carry the sewage to the southern perimeters of the town. Two kilometres outside the gates of the town, the domestic sewage of 240,000 inhabitants unite with the industrial wastewater in a shallow evaporation basin, forming a brown, unpleasantly smelling sludge. The wastewater is not treated. KfW has been supporting the construction of a three-level pond sewage plant that is to start operating towards the end of the year.

An appeal for hygiene

Given the precarious supply and sanitation situation, the director of health services in the Department of Oruro, Rojas, has appealed to people to observe personal hygiene as much as possible. The project is meeting his demand for better health education. Two school courses mark the beginning of a continuous sanitary education programme. However, people working hard all day to earn a minimum living, without time to supervise children playing and having to sacrifice one to two hours a day at a public standpipe for two buckets of water will have difficulty ensuring even the most necessary hygiene. Water from a tap is an indispensable prerequisite for this. However, the tap in the house and the connection to the sewers still tend to be a privilege the wealthy enjoy in Bolivia. ■

The author is a freelance journalist in Esslingen.

Public and private executing agencies

The situation. Just under a third of the Bolivian population have access to safe water supplies, and less than a quarter are connected to sewage systems.

The target. The umbrella and special-purpose association ANESAPA, which unites Bolivia's 14 largest drinking water and sanitation utilities, performs its role as a utility, increases its own share of financing and promotes the institutional development of private companies as well as hygiene education.

The concept. Experts advise the association and companies on the efficient employment of means and management and setting norms and standards and support the National Service System for Continuing Education, Advisory and Consulting Services (SAS) in this sector.

The partners. The ANESAPA association, the regulatory authority and the Vice-Ministry for Basic Sanitary Services, representatives of SAS, MVV and the two utilities in Potosí and Oruro.

The costs. The BMZ is supporting Technical Co-operation in drinking water supply and wastewater treatment in Bolivia with a total of just over 2.6 million euros.

Michael Rosenauer

An operative and personal gain

There are a number of projects in Bolivia that focus on drinking water and sanitation. Now they are being combined in one programme. Whether it be sector policy, the quality of services, better management, sanitary education or community issues, all this and much more is going to be developed en bloc in future. Akzente asked Michael Rosenauer what the impact of joining forces has been like on activities at local level.

Why did GTZ and its partners in Bolivia decide to replace the projects in basic sanitation with one programme?

Michael Rosenauer: One reason was that the consultancy processes urgently needed improving. In their previous form, activities could not be co-ordinated effectively enough via the National Association of Drinking Water and Sanitation Utilities (ANESAPA), the project executing agency for three of the four projects. The newly formed programme eliminates artificial barriers and petty jealousy. Generally, we are reckoning with more synergies. The programme sharpens our profile and image among partner organisations, international organisations and the public. And one final and by no means insignificant reason is that GTZ and KfW can show their potential even more to advantage. I think it is appropriate to say that the programme discussion centring on basic sanitation has brought us closer together in conceptual, operative and personal terms. One example of this is the flexible interaction of Technical and Financial Cooperation in the Drinking Water and Wastewater Associations of Chaco and Bustillo.

Supply deficit. Only around two thirds of the Bolivians have safe drinking water. While 90 percent of the urban population have clean drinking water, this share drops to 39 percent in the rural communities.

What are the internal priorities of the new organisational concept?

Of course, as an organisation developer, my intention is not to merely add together project numbers but to establish an efficient overall team. Attitudes are changing among the staff of the former individual projects. Instead of speaking of "my project", they now refer to "our programme". This is beginning to bear fruit. The specific specialist potential each individual has can be put to use for other sub-components.

One important methodological change is that our programme components for community development as well as consultancy and upgrading are now open to the sector as a whole. And the components referred to now render certain programme-internal services for enterprises and municipalities. This enhances efficiency and raises customer orientation within the programme. One final aspect is that a single functional team concentrates administrative processes and thus saves costs, which raises budget discipline. At the same time, each service unit has a clear overview of its operative budget.

What are the programme's benefits in terms of international cooperation?

As far as cooperation with other donors is concerned, two tendencies emerged right at the beginning of the process. First of all, good ideas, which many other international organisations also have, can only be put into practice in a sustainable manner if a balanced national, international and regional specialist and management team is present in our programme. The level of financial transfers to so-called basket funds in which the donors concentrate their individual funds is of secondary importance. We above all owe the quality of our consultancy activities, for example in developing a consensus for the Bolivian Drinking Water and Sanitation Law, to our team's expertise. Second, many donors, such as the BID, the World Bank, Sweden, the Netherlands or Canada, either have no structures at all at local level or if they do, they are only of a very limited nature. This adds to the significance of the instruments we are using.

Is the example of Bolivia typical of GTZ's future activities in Latin America?

Our model can certainly represent a sensible strategy in other Latin American countries as well. However, this demands that we no longer regard Technical Cooperation exclusively as helping to address a core problem in a partner country and bidding farewell when it has been solved. Programmes bear a long-term contribution to complex human, institutional and thematic development processes that will again and again result in new problems and issues at a higher level. ■

Michael Rosenauer was interviewed by Sabine Tonscheidt.

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