

Minutes

The organizers would like to thank all speakers and contributors as well as the DAAD and the German Embassy for making a fruitful and successful event possible. More than 300 registered participants showed the great importance of the topic for Egypt and the MENA region. One could see during the workshop that there is a large potential for collaboration between Germany, Egypt and the MENA countries. But capacity building is a major factor for beneficial collaboration. For a better understanding of the problems and getting to know and bringing together people events like this workshop are important. In case of SUSWATEC the University of Duisburg-Essen, TU Munich and TU Braunschweig worked together with many partners from Germany, Egypt and the region. All partner institutions are listed at the end of these minutes. We are very thankful for the contributions of the industrial representatives from the Holding Company for Water and Wastewater in Egypt and the Emschergerossenschaft/Lippeverband from Germany, who made a better stakeholder view possible.

During the workshop we could reveal the following main aspects of interest to be further discussed:

- **Importance of quantity AND quality**
- **Role of new technologies**
- **Role of wastewater in water supply**
- **Participation and integration of the people**
- **Need for holistic approaches**

Importance of quantity AND quality

Many discussions and decisions/regulations in Egypt and the MENA region are based on water quantities. There are regulations on the amount of water to be taken by each state from the Nile River or defined quantities to be produced by different plants. The focus of these regulations is on quantities, but mainly not on the water quality. New regulations should much more integrate water quality aspects. Quality monitoring should be performed regularly and the data should be available for anyone who needs it. For sustainable management there is major need for data on water quality, hydrological aspects as well as the usage over long time periods to support regulatory approaches (e.g. metering tariffing) and adjust treatment processes. The European Water Framework Directive might be an example how it can work.

Role of new technologies

A wide range of new technologies is available nowadays, but still there are many opportunities in technical development. Membrane technologies can enhance the treatment processes. Desalination may be a clue for treatment in regions where only brackish or sea water is available, but the design should also integrate environmental aspects (e.g. influence of brine on marine life) and not only focus on productivity. Oxidative processes may help in solving some treatment problems e.g. with disinfection by-products, but they are quite cost intensive. The expenses for new technologies are one major problem to be solved. Technologies for the region have to be low-cost adopted. There is a large potential for further joint projects between German and MENA country partners in this direction. Nevertheless treatment has a central role for many approaches in the region. Implementation of combined systems with water treatment, usage of the occurring sludge for energy production (also involving solar solutions) and wastewater reuse for afforestation or agriculture can be the future for the region.

Role of wastewater in water supply

The perception of wastewater differs a lot between Europe and MENA countries. Treated wastewater is a highly competitive resource here. It can be used in agriculture as well as in afforestation projects aiming to enhance climate. Most of these purposes would have beneficial outcome to the country and the people, when designed well. Deserts could become green and may enable rainfalls. In all cases the resource should be fit for purpose, so adequate and affordable treatment steps are needed before this resource can be used. There is a need for further studies to reveal the effects of wastewater reuse on the water cycle and to investigate the occurrence of pollutants and pathogens which might affect the environment as well as human health. Treatment has to be adapted to the source of wastewater. Industrial wastewater needs other treatment than municipal. But the starting point should always be to avoid pollution directly at the source (companies and households). A complex and expensive treatment is not needed when the water is not polluted. Water pricing has to be discussed more intensively, as companies polluting the rare resources should pay for the treatment and probably more sensitivity for the water problems would appear when farmers would have to pay for the used irrigation water. Nevertheless projects on wastewater reuse have high potential in the region and should be in the future focus.

Participation and integration of the people

The communities in MENA countries should be aware of the existing and increasing water problems. Appropriate education should already start on the primary level to raise the interest and awareness of the people for a sustainable usage of water. Much more transparency and participation by the public in regulatory approaches is needed. A fair pricing policy should be discussed between stakeholders and the public. Centralized and decentralized approaches in respect to the usage as well as in the treatment and pricing have to be compared. Models for accounting the agricultural water usage should be discussed and arranged together with the farmers. The different authorities should also work together for a more holistic and sustainable water management. Corruption seems to be a major problem in MENA countries, so “protected corruption” itself should be investigated and as probably not erasable also taken into account for further planning.

Need for holistic approaches

There is a need for integrated convergence on water in the MENA region. Quantity and quality assurance and sustainable management can only work while integrating the whole catchment. Approaches should not be fragmented by boundaries and responsibilities or focused only on small parts of the water cycle. Tough transnational approaches last long time periods to develop there is urgent need in MENA countries. The Water Framework Directive is a good example how regulation on water management can work throughout borders. Of course this law is based on the fundament of the European Union and a long lasting joint history, but probably water is one key factor to bring together the Nile River or MENA countries and strengthen their collaboration. New technology can help a lot, but without appropriate and sustainable management it will fail in terms of impact. Socioeconomic aspects, ethics, transparency and involvement of the people are also necessary to reach a holistic and sustainable development. The people need clear visions.

Partner institutions:

Egypt: Cairo University, Fayoum University, Ain Shams University, Alexandria University, National Research Center, Egypt Nanotechnology Center, Holding Company for Water and Wastewater, Agriculture Research Center, Minister of Drinking Water and Sanitation Facilities, Ministry of Agriculture and Land Reclamation

Tunisia: National Research Institute for Rural Engineering, Water, and Forestry; Higher Institute of Agronomic Sciences of Chatt-Meriem, Institution of Agricultural Research and Higher Education, University of Sousse

Jordan: University of Jordan

Germany: University of Duisburg-Essen, Technische Universität München, Technische Universität Braunschweig, Technische Universität Berlin with Campus El-Gouna, University of Bremen, Hochschule Ruhr-West, Emschergenossenschaft/Lippeverband, German Academic Exchange Service (DAAD), German Embassy in Egypt