

SCOPE

1. Challenges for Future Cities and Efficient Agricultural Production

Satisfying the increasing demands for freshwater for a growing population, through urbanization and industrialization as well as for agriculture, carries the risk of aggravating the conflict between economic and ecological needs. This includes all aspects of water availability and water quality. Providing water security for our future cities requires appropriate technical infrastructure systems for water supply and sanitation together with an environmentally optimized management. There is a need to refurbish existing urban water infrastructure systems, even in developed countries, and, at the same time, to provide further developed new infrastructures thus improving the provision of water and sanitation services. It is essential to strategically design further developed water infrastructure systems, their management and regulatory framework, towards being much more sensitive to the relationship of water and energy as well as to assure a substantial increase in the efficiency of an overall water usage including the re-use of water.

Key topic areas:

- 1.a Future water related, anthropogenic material cycles
- 1.b Security and efficiency of water infrastructures including water treatment, water supply and sanitation planning including IT support
- 1. c Energy efficiency in water usage
- 1.d Heavy rain and flood management
- 1.e Management of waste water and its usage including material flow management concepts
- 1.f Water related environmental protection in urban planning (including information management)
- 1.g Multi-resource water and waste water infrastructures
- 1.h Evapotranspiration management
- 1.i Water body modeling: methods and practical solutions

2. Competing Water Uses

Availability of water is vital for development. Since the overall demand for water is increasing and water resources are finite, water must be shared between domestic / municipal, industrial, agricultural, and hydropower users as well as between regions. This in turn increases the competition for water resources in terms of both water quantity and water quality. Competition becomes more aggravated through climate change and the vulnerability of the supply and sanitation systems to increasing climate extremes.

Key topic areas:

- 2.a Optimal and sustainable use of water in anthropogenic value generation
- 2.b Water resource allocation considering socio-economic criteria
- 2.c Climate change and effects on water resources availability, water quality and usage
- 2.d Inter-regional water transfer and effects on regional climate
- 2.e Inter-regional water transfer and effects of transportation on water quality
- 2.f Water related conflicts between energy and food production

3. Regulatory and Policy Framework

Using water in domestic, industrial and agricultural processes is normally associated with a great many of externalities. Therefore, a proper legislative and regulatory framework is prerequisite for the proper management of water supply, sewerage, storm water services and water usage which are essential for public health, economic development and environmental protection. Proper implementation and compliance with such frameworks reduce the impact of externalities and, at the same time, opens- up opportunities to substantially improve resource efficiencies within the respective water user groups.

Key topic areas:

- 3.a Demand side water management
- 3.b Life cycle costing of water related capital investments
- 3.c Water saving and water re-use regulations including incentives for implementation
- 3.d Water efficiency frameworks
- 3.e Public and private water policies
- 3.f IT architectures for water monitoring, management and decision support
- 3.g IT support of environment legislation, regulations and directives for water monitoring and management including information modeling