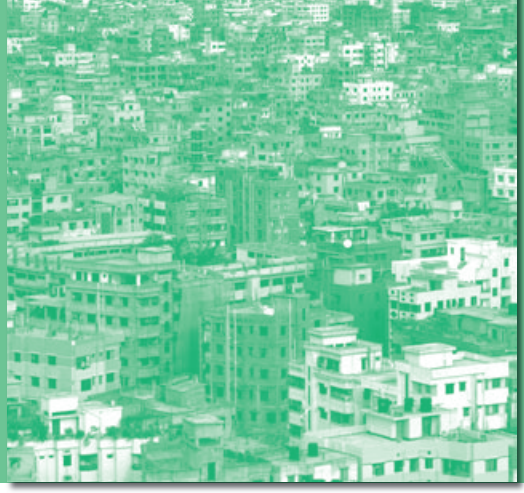

Water and Cities in the Green Economy

Information brief

- **Half** of humanity now lives in cities.
- In urban areas **94%** of people have access to improved drinking water sources compared to 76% in rural areas.

Main challenges

Urban population growth

Half of humanity now lives in cities, and within two decades, nearly **60%** of the world's population will be urban dwellers. Cities cannot be sustainable without ensuring reliable access to safe drinking water and adequate sanitation. However, water supply and sanitation services in urban areas have generally failed to keep pace with urban population growth. Global economic expansion also contributes to increased water demand through the rising number of consumers, desire for higher levels of service and changes in consumption patterns. Although worldwide the proportion of people with access to water and sanitation gradually increases, in 2008 there were more urban dwellers without access to improved water sources (**114 million** more) and basic sanitation (**134 million** more) than in the year 2000.

- *The urban population is expected to **double** between 2000 and 2030 in Africa and Asia.*
- ***One in four** urban dwellers does not have access to improved sanitation facilities.*
- ***27%** of urban dwellers in the developing world do not have access to piped water at home.*
- *In developed countries an average person uses **500-800 liters** of water per day, which is 10 times more than the average in least developed countries.*

Poverty

Urban growth is most rapid in the developing world, where cities gain an average of **5 million** residents every month. This brings along many challenges, especially for the urban poor. Worldwide, **828 million** people live in slums, lacking many of life's basic necessities: safe drinking water, adequate sanitation services, access to health services, proper housing and secure tenure. The lack of adequate water and sanitation facilities leads to health issues such as diarrhea, malaria and cholera outbreaks. Slums or informal settlements are often built on unstable slopes, or in other areas of high risk. Natural disasters such as floods and droughts form a major challenge for cities, especially for slum areas. The frequency of natural disasters is expected to increase in the future as a result of climate change.

- ***62%** of sub-Saharan Africa's urban population and **43%** of south-central Asia's urban population live in slums.*
- *The number of people living in slums is expected to grow by **6 million** each year to reach a total of 889 million by 2020.*
- *The poor pay more. A slum dweller in Nairobi (Kenya) pays **5 to 7 times** more for a liter of water than an average North American citizen.*

Pollution and water loss

In addition to the lack of access to water and sanitation and natural disasters, pollution forms a third major challenge for cities. Urban settlements are the main source of point-source pollution. Furthermore, in many fast-growing cities, wastewater infrastructure is non-existent, inadequate or outdated. Water storage, treatment and distribution systems are often poorly maintained. Moreover, in many countries of the developing world, water losses, due to technical leakage and water theft, often exceed **40-60%** of the total water distribution.

- *The city of Jakarta, with a population of 9 million, generates **1.3 million m^3** of sewage each day, of which less than **3%** is treated.*
- *Bogotá, Quito and La Paz are populated cities in the Andes that discharge their wastewater mostly untreated in the rivers at more than 2.000 meters of altitude with detrimental effects along all the river systems downstream.*

Opportunities for cities in the green economy

With the majority of the **world's economic activity** and now over **50%** of its population concentrated in urban areas, cities have a central role to play in the realization of a green economy. How cities develop has far-reaching effects on economies, energy use and climate change. Furthermore, a green economy thrives on innovation and many of the more ambitious and sustainability-oriented innovations have emerged within cities; in the density of institutions, people and infrastructure.

As centers of **social interaction and economic activity**, cities are the critical spatial platform for the formulation and implementation of policies across sectors. It is in cities that economic growth and decent jobs can feasibly be balanced with an environment free from the risks of climate change and ecosystem degradation. Cities can catalyze an efficiency shift by targeting investment at well-planned greener transport infrastructure. Along with integrated transport planning, low-carbon fuels and electrification of transport, these innovations will help meet sustainability targets.

Urban densification – when sensitively planned and supported by sustainable infrastructure – allows for more efficient and sustainable patterns of development. Compact cities reduce the spatial footprint of development and shared infrastructure reduces emissions and resource use. By harnessing the advantages of concentrated populations, cities can reduce dependency on transportation and infrastructure and provide basic services with greater efficiency. Creative planning for compact and dense urban development that incorporates parks and green spaces can reduce commuting distance and energy consumption in buildings, while contributing to climate stabilization and biodiversity.

Highlighting practice

This section outlines several approaches for transitioning to the green economy in cities highlighted by the organizations participating in the conference.

Sustainable urban development

- Land mosaic patterns that provide for large green patches and more sustainable urban development. Two urban patterns, the **"compact concentric zone"** and **"satellite cities"** models, can best provide for both human and ecological systems. These patterns preserve a greater number of large patches of land within which nature can thrive, whereby flooding and landslides can be prevented, while at the same time allowing for population and economic growth.
- Promotion of **compact cities** and planned extension of urban areas.
- Balance of **strategic facilities** with **diversified** local economic opportunities. As an urban centre grows, the range and number of the functions that it supports generally increases. Facilities such as good harbors, an international airport, universities and a financial centre strengthen the competitiveness of a city-region and support value chains throughout the area. At the same time, diversifying local economic opportunities diminishes the demand for mobility, hence reducing energy use.
- Expansion of **network infrastructure** while getting the most out of existing networks.
- Construction of 'greener' built environments that use water and energy efficiently. Both regulatory approaches (e.g. strengthened building codes) and incentive-based strategies (e.g. green building rating tools, green mortgages) can promote **green buildings**.
- Technologies such as **"green roofs"** can reduce runoff, reduce the heat island effect in cities and so reduce cooling demand, and remove pollutants from the air.
- **Clusters** of green industries and jobs. Decision-makers can support the growth of clusters of green industries and green jobs, e.g. through three-way linkages between universities, business and local authorities.
- More **efficient intra-urban resource flows**, for example by establishing urban growth boundaries to limit urban sprawl, incentives for car-free developments, and density bonuses for developments that support city-wide sustainability.

Ecosystem services

- **Protection of valuable ecosystems services and biodiversity** hotspots in urban areas while increasing resilience to natural disasters. Safeguarding ecosystems involves conserving blue-green patches and corridors accordingly.
- Cities depend on a diversity of services provided by peri-urban ecosystems. This connection can be made visible when

Implementation of an integrated project of water supply and sanitation services for the urban poor in Kagugube parish, Kampala (Uganda)

Main challenges: The urban poor lack access to water and sanitation services.

Focus and objectives

- Extend access to water supply and sanitation to the urban poor using innovative sanitation technologies, improved water distribution infrastructure and approaches.

Approaches

- Establishing sanitation services tailored to the needs of the urban poor in the low-income community, with a special focus on Ecological Sanitation.
- Expanding and rehabilitating the water supply network.
- Installing pre-paid stand pipes in order to ensure access to water for the urban poor at the official tariffs.
- Strengthening the **National Water and Sewerage Corporation (NWSC)** Unit charged with developing pro-poor infrastructure and operational mechanisms.

considering the options to guarantee water services to the city (as in the case of New York where the preservation of close ecosystems avoid costly water infrastructures)

Governance

- Strong and consistent **political leadership** to ensure that cities and their green economies are successful. This leadership is needed to enable structured progress and a coordinated approach.
- Generation of **political will** to realize green initiatives and implement green policies.
- **Partnerships** between government, industry and communities to create and implement green policies and regulatory reforms.

Sustainable urban water management

- **Integrated urban water management** (IUWM) to facilitate the multi-functional nature of urban water services in order to optimize the outcomes of the system as a whole. This involves managing freshwater, wastewater, and stormwater as linked within the resource management structure, using an urban area as the unit of management.
- Integration of **land and water management**. Land use planning and building regulations have proved in some areas to be highly effective ways of promoting sustainable urban water management.

Improved sanitation and water supply service delivery to the urban poor in Ghana through tripartite partnerships

Main challenges: The urban poor lack access to improved sanitation and water supply services.

Focus and objectives

- Increase access to sanitation and water supply in three urban pilot areas.
- Strengthen sector capacity for planning and delivery of pro-poor WASH services in urban areas through tripartite partnerships approaches involving the public, private and NGO sectors.

Approaches

- Test a range of different innovative management models, approaches and technologies for providing WASH services to the urban poor.
- Provide infrastructure in three pilot areas (two small towns and one urban slum) under the new management models.
- Support the development of a more enabling environment by undertaking awareness-raising and advocacy activities.

- **Simple solutions**, such as water loss reduction and regular operation and maintenance, can give big results that often surpass heavy investment in hard infrastructure.
- The **"Cities of the Future"** programme of the International Water Association (IWA) focuses on water security for the world's cities. Cities – and the water management, treatment and delivery systems that serve them – could be harmonized and re-engineered to minimize the use of scarce natural resources and increase the coverage of water and sanitation in lower- and middle-income countries[1].
- Provision of **water and sanitation** to informal settlements.
- Use of techniques for domestic **water reuse** for toilet flushing, garden watering, etc.
- Technological development for **urban water production:** nanotechnologies to reduce pollution and accelerate filtration.

Management of wastewater and pollution

- Separation of **pollution** streams at source.
- Use of **grey water.**
- Making water **conservation** and **reuse** possible and affordable.
- **Campaigns** for pollution abatement.
- Techniques for establishing **sustainable drainage systems** (SUDS) in high density cities (→15,000 people per km2).
- **Protection of infrastructure** used to treat and transport water (including sources, treatment plants and distribution systems) to ensure safety for public health and the environment.
- Wastewater management is an issue on the agenda of a number of t he region's cities. Santiago, Chile, has created a plan known as «Clean Urban Mapocho,» whose goal is to clean up the water of the Mapocho River and, by 2012, make Santiago the first Latin American capital that recycles all of its wastewater. This involves closing 21 subsystems that discharge wastewater into the river, along with constructing a 28-kilometre underground collector parallel to the river to feed two treatment plants. This will have the additional advantage of restoring the river banks as places for public recreation (Chile: Superintendence of Sanitation Services, 2008).

Economic instruments

- **Price regulation** for water suppliers and wastewater managers that promotes sustainable water use.
- Practical **tariff systems** for consumers whose income is low as well as variable.
- **Incentives and regulations** in the building and construction sector offer opportunities for cities and local governments to leverage their authority through the promotion of green building materials and construction technologies, mandatory investments in energy efficiency and the installation of renewable energy technologies in buildings.
- **Remittances** for investment in water services.

[1] For more information see: http://www.iwahq.org/3p

Innovative initiatives for conserving and managing forests as sources of water for Fukuoka City, Japan

Main challenges

- Fukuoka relies on the Chikugogawa River for one-third of its water and on the cooperation of neighboring local governments in developing dams to provide the remainder of its drinking water.
- Forest degradation surrounding the dams which provide water supply to Fukuoka City is impairing the forests' recharge functions, jeopardizing the city's water supply

Focus and objectives

- Forest conservation in water source areas to improve water recharge.

Approaches

- Collaborative projects with headwater areas and cooperation among local governments.
- The municipality funds forest management in water source areas, local exchange programs, and contributions to a river basin based partnership fund comprised of neighboring municipalities.
- Forest management plans are drafted to effectively maintain forests even on private lands.
- Forests in catchment areas are purchased in order to enhance water recharge capacities and prevent water contamination from excessive development.
- Citizens are invited to take part in silvicultural management activities, rice planting and catching trout upstream.
- The municipality offers grants that support civil activities to plant trees and clear underbrush as well as other interactive programs.

Raising awareness

- **Involvement of end users**, particularly women, in water management to optimize benefits from water projects. Water managers can work with the users of water and sanitation services to find out their needs and identify appropriate solutions.
- Effective household **demand management campaigns** (e.g. Copenhagen, Denmark; Zaragoza, Spain).
- **Education** can raise awareness of the need for sustainable water use. Water, sanitation and hygiene education is also important for ensuring the integrity of both human and environmental health.

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