

# SWITCH PROJECT: BELO HORIZONTE, BRASIL

## BELO HORIZONTE

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## VISION & GOALS FOR URBAN WATER MANAGEMENT

- Integrated Catchment Planning as a strategy for the IUWM

BEHLA vision seeks to enhance management integration of water supply, sanitation, stormwater and solid waste management.



## DEMONSTRATIONS

### Experiments on source control for stormwater management

Development of new stormwater source control technologies; infiltration trenches and detention systems; pilot studies to monitor water quality and quantity.

Retrofit infiltration trenches: evaluation of the feasibility of retrofitting infiltration trenches in urban areas.

### Innovations in the treatment of wet weather diffuse pollution

Retrofit of wetland and detention basins: assessment of the pollutant removal performance of retrofitted BMPs together with an evaluation of the social acceptability of locating water quantity and quality management systems within recreational areas.

### Combined detention basin and creek restoration

An assessment of the impact of a detention basin in relation to runoff and pollution abatement together with an evaluation of the public perception of risk in urban areas (health risk, flooding risk) as well as public perception and acceptance of detention facilities.

### Studies on flood forecasting, flood warning and emergency planning in the context of urban flash floods

Studies for the implementation of a support system for decision-making on occurrences of urban floods, including modelling, monitoring, flood forecasting, emergency planning.

## POTENTIAL FUTURE SCENARIOS

Water supply shortages due to limited capacity, global change on the hydrological regime and use of treated water in irrigation of gardens and washing of pavements.

Impacts on the catchments used to supply water: water quality degradation.

Pollution of receiving waters by wet weather diffuse pollution.

## RESEARCH FOCUS AREAS

Use of non-conventional solutions in urban drainage infrastructure.

Development of a decision support system on flood risk management.

Organization of an optimized system of mathematical modelling of the stormwater system.

Organization of a system of quality indicators of services rendered for urban drainage.

Studies for a management model of the city urban water services.

Institutional analysis of the current frameworks and participatory scenario building for IUWM at the local, city and metropolitan levels, looking at global trends for water management in the cities of the future.

## BELO HORIZONTE LEARNING ALLIANCE

Learning Alliance (LA) activities in the Belo Horizonte Learning Alliance (BEHLA) are oriented by issues related to integrated urban water management (IUWM) and associated research topics. Activities include:

- Documentation process: search and analysis of IUWM document
- Socio-environmental research: evaluation of the social acceptability of locating stormwater management facilities (BMPs) within recreational areas
- Publication of a SWITCH Newsletter
- Environmental Education at the Anne Frank Municipal School, regarding rainfall harvesting
- Activities in Lagoa do Nado Municipal Park related to field experiments (reuse of water, infiltration trenches) and stakeholders integration
- Participation of LA members in the Municipal Climate Changing Committee in Belo Horizonte
- Regular meetings with stakeholders to formulate a vision of future urban water management in several territorial scales.

### LA Members

Amongst the several stakeholders involved in BEHLA, the following have played an important role:

- PBH – SUDECAP (SWITCH partner)
- UFMG (SWITCH partner)
- COPASA: water and wastewater utility – Minas Gerais state-owned company
- Federal Ministry of Cities, represented at BEHLA by the national Programme for the Modernisation of the Water Supply and Sanitation Sector (PMSS)
- Municipal Secretary of the Environment - Belo Horizonte (SMAMA)
- Municipal Secretary of Urban Policies - Belo Horizonte (SMURBE)
- DRENURBS Programme: creek restoration in the urban area
- Climate Changing Municipal Committee
- Manuelzão Project: a UFMG programme concerned with public participation on environmental quality enhancement
- Lagoa do Nado Municipal Park

### Potential Members

- Brazilian Associations of Water Resources (ABRH) and of Environmental Sanitation (ABES)
- Velhas River Basin Committee
- Federation of Industries of the Minas Gerais State
- AMDA: The Minas Gerais Association for the Protection of the Environment
- Municipal Councils of Housing, Health, Environment, Urban Policies, Sanitation
- Brazilian Institute of Architects
- CREA-MG: Regional Council of Engineers and Architects

## MEASURING SUSTAINABILITY

- The Municipal Environmental Sanitation Plan (PMS): an important instrument to ensure IUWM in Belo Horizonte. The PMS adopts an indicator, called ISA, as one of the criteria for prioritising actions and interventions that will be implemented over a period of four years.
- Hydrologic and water quality monitoring system in order to assess the effectiveness of policies and actions
- Development and implementation of indicators of sustainability.



## BELO HORIZONTE'S WATER SYSTEMS & PRESSURES

- Illicit inter-connections between the wastewater and stormwater networks prevail, resulting in heavily polluted receiving bodies in the urban area and in the Velhas River downstream of the city.
- Lack of interceptor pipelines as part of the main sewerage system.
- Flood risk: occupation of flood prone areas.
- The water supply system (drinking water) connects to 99.7% of BH residents. The system presents high standards in terms of operation as well as water quality.
- 92% of the population is connected to the wastewater sewerage system. There are two recent wastewater treatment plants in operation: the Arrudas WWTP and the Onça WWTP, with a total capacity of 4.0 m3/s, treating about 38% of the flow collected.



### Issues and challenges

- Relating to the wastewater system, there are heavily polluted receiving bodies in the urban areas due to the lack of interceptor pipelines and illicit inter-connections between the wastewater and stormwater networks
- Health risks due to direct human contact with polluted water include diseases associated with lack of sanitation
- The risk of floods threatens material damage and loss of life.

## FACTS & FIGURES

- 2,412,937 inhabitants with a population density of 7,291 inhabitants/km<sup>2</sup>
- A planned city, built in 1898 to become the capital of the state of Minas Gerais, in an area of 330 km<sup>2</sup>
- The overall metropolitan area consists of 33 distinct municipalities with an area of 9,179 km<sup>2</sup> and 3,900,000 inhabitants.

