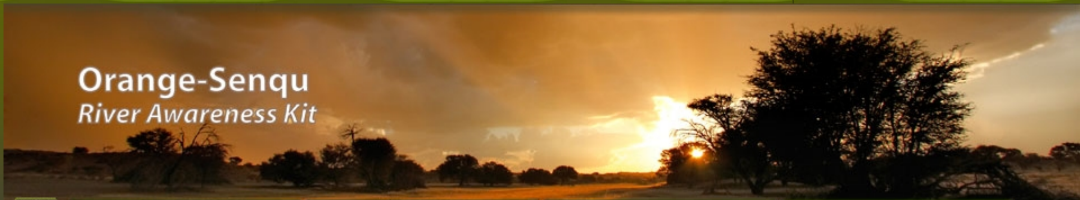

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Water Infrastructure:

Water Treatment

Pure water is not found in nature. Chemicals and other bacteria enter water from its sources thus water needs to be treated to become fit for its desired use.The main objective of water treament is to remove contaminants(human and industrial effluents) or reduce their concentration.

Conventional water treatment typically involves a three-phase process:

1. First, in the primary water treatment process untreated water is passed through a series of screens to remove solid wastes;
2. Second, screened water is then injected with pretreatment chemicals which disinfect the water by killing harmful bacteria and viruses; and
3. Third, further residuals are removed through flocculation and water then travels through filtration removing finer particles before it is disinfected again and ready for use.

Water Treatment Facilties

Water treatment plants in general vary according to two types:

- potable water treatment
- wastewater treatment

In general waste water is used for other uses such as industrial use but some countries including the Orange-Senqu Basin state of Namibia rely heavily on it to supply drinking water.

Botswana

The Ministry of Minerals,Energy and Water Resources is responsible for the policy in the water sector in Botswana. The Departments of Water Affairs and Waste Management and Pollution Control (DWMPC) are responsible for water and waste water treatment facilities respectively.

The Department of Water Affairs and district councils have installed a number of facilities around the country for treating potable water for communities using the conventional water treatment process.Gaborone has three water treatment plants and Francistown one plant that use biological methods for treating water.

The mining sector in Botswana currently use boreholes(ground water) and waste water to supply operations. The larger mines have their own water treatment facilities and Debswana has a fully commmissioned potable water supply which also supplies water to the community in Orapa.

Challenges

The DWMPC in Botswana continues to face some challenges with public water and waste water treatment facilities that include:

- No regular de-sludging
- Improper methods of de-sludging
- Poor Maintenanmce
- No records
- Poor on -site supervision

Namibia

A number of institutions are responsible for different aspects of water supply, management, and use, including government departments in Namibia. Two key players have been listed below;

- Namwater, a parastal institution that is responsible for the bulk of water supply;
- The Department of Water Affairs, which is responsible for all water resources development projects

NamWater has 16 water treatment plants scattered around the country providing drinking water as well as water for industrial use. As in Botswana most mines in Namibia possess their own water treatment plants which should comply with the country's standards for water quality.

Challenges

Namibia has limted water supplies and continues to face the challenge of producing clean, drinking water from wastewater for its rural communities.

Lesotho

The Water and Sewerage Authority (WASA) within the Department of Water Affairs in Lesotho's Ministry of Natural Resources is responsible for the provision of urban water supply and sanitation services and regulating water treatment plants.

This entity is responsible for the Maseru treatment plant which is the biggest in the country producing a capacity of 27500m³/d. This plant is currently undergoing expansion. Further to the new plant being built in the Pisteng area of the rural Leribe region, other water treatment facilities are scattered around Lesotho in the Roma, Teya-Teyaneng and Maputsoe areas amongst others.

Interactive

Basin Map

Explore the sub-basins of the Orange-Senqu River

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Water Management

Explore the water management systems around the basin - including intra-basin transfers and sectoral water requirements

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Dams

Investigate the dams and water infrastructure in the Orange-Senqu basin

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Video Tour

Tour video scenes along the Orange-Senqu River related to Meeting the Water Challenge

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Panel Discussion

Listen to a panel discussion about the history and challenges in the Orange-Senqu basin

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Challenges

The biggest challenge for Lesotho is providing treated water for the remote and rural areas of the country, as accessibility is a major problem.Sometimes, as is the case with the Leribe treatment plant, 'abstraction points are washed away during seasonal floods' adding to the challenge(Burger 2011).

South Africa

South Africa's 1600 municipal water treatment plants treat 7.6 billion litres of waste (industrial, sewage etc) per day and sell water to major industrial users as well as providing driniking water for municiplaities.Generally water infrastructure in South Africa is well developed in the urban areas and majority of the urban population uses potable water.

The public water and sanitation sector in South Africa is organized in three different tiers:

- The national government, represented by the Department of Water Affairs (DWA), as a policy setter.
- Water Boards, which provide primarily bulk water, but also some retail services and operate some wastewater treatment plants,
- Municipalities, which provide most retail services and also own some of the bulk supply infrastructure.

Challenges

The challenge that still lies ahead is with small scale water treatment facilities that provide water for rural communities.A survey involving 181 selected small water treatment facilities across seven provinces in the country reflected that a number of these do not meet effluent standards(Thompson 2008).

Beyond these technical problems, other challenges included:

- poor maintanence practices
- lack of technical skill
- poor working conditions
- insufficient financial capacity
- poor recording, documentation and communication

Next: Irrigation

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