

Wastewater Production, Treatment and Use in Namibia

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Wastewater production and treatment

Recycling of wastewater is a high priority not only for irrigated agriculture but also for domestic and industrial use. In semi arid zones wastewater may constitute 25-75% (UNEP, 2000) of the available irrigation water. Re-use of wastewater requires consideration for health impact among other factors. The capital city, Windhoek generates an average of about 12, 8 Mm³/year of domestic wastewater, while the second largest city of Walvisbay produces an average of about 0.66Mm³/year. The domestic wastewater from Windhoek is treated through the primary, secondary and tertiary treatment processes so as to attain a high quality of effluent which can be reclaimed to portable standards. About 30% of the reclaimed waste water is blended with raw water and supplied to consumers. The industrial wastewater production for Windhoek was about 0,3 Mm³/annum (Lahnsteiner and Lempert, 2005). The industrial wastewater for Windhoek is treated in anaerobic and aerobic ponds and is released into the environment. The wastewater from Walvisbay also goes through the primary, secondary and tertiary treatment processes.

Wastewater use/disposal

The major wastewater use in Windhoek is direct reclamation to portable standards, with about 30% of reclaimed water blended with raw water and supplied to the city. There is horticultural production on about 1,5 ha of land irrigated by semi-purified wastewater effluent in Windhoek. The main vegetables grown are spinach (*Brassica Campestris*), cabbages and spring onions grown near the stream where the semi-purified effluent is discharged. The water is pumped via pipelines and is applied using flood irrigation to the vegetables. The other portion of about 5 000 m³/d of the semi-purified water is used for irrigation of sports fields and golf course in Windhoek (Lahnsteiner and Lempert, 2005). About 40% of the effluent produced at Walvisbay is used for irrigation of lawns, golf courses and sports fields. The remainder of the effluent is discharged to reeds for further removal of nutrients.

Type of recycled water use	Treatment
Reclamation to portable water	Primary, Secondary (Activated sludge System & trickling filters) Secondary sedimentation, Maturation ponds, Coagulation, Dissolved air flotation, Rapid Sand filtration, Ultra filtration, Ozonation, Disinfection, Stabilisation, Blending.
Irrigation: parks, sport fields, vegetables	Primary, Secondary, Maturation ponds

Table 1: Treatment processes for different water use.s

Policies and Institutions set-up for wastewater management

The Windhoek and Walvisbay municipalities are responsible for the collection, conveyance and treatment of wastewater for their cities. They are also responsible for the irrigation of lawns and sports fields. Reclamation of waste water is a responsibility of the city of Windhoek together with a private company. The quality of reclaimed water produced meets the international guidelines and national standards developed by the Ministry of Agriculture Water and Forestry (MAWF). The water used for irrigation also meets the international guidelines. Effluent quality is monitored at the end of the conventional treatment process to check if it meets environmental water quality standards. The Water Management Act and Environmental Management Act prescribe the minimum standards for effluent discharge so as to promote sustainable management of the wastewater. MAWF, Ministry of Health and Social Services (MoHSS), Ministry of Environment and Tourism and Non Governmental Organizations (NGOs) like Cuve waters are institutions involved in wastewater management which makes wastewater management a multi sectoral activity. MAWF in its National Water Policy of 2000 alludes to the “polluter pays principle” so that the polluter pays the cost of remedial action. The Namibian sanitation strategy of 2011 identifies re-use of effluent for irrigation as a selection criterion for sanitation systems.

Research/practice on different aspects of wastewater

In Namibia research on wastewater aspects is more inclined towards water management for the purpose of reclamation to potable water standards.

Water Management in Windhoek Namibia:
<http://www2.gtz.de/Dokumente/oe44/ecosan/en-water-management-windhoek-namibia-2005.pdf>

Treatment of Wastewater for Re-Use in the drinking Water System of windhoek (J.Menge)
http://www.wvreclamation.com/pdf/Treatment_of_wastewater_for_Drinking_Water_in_Windhoek_J_Menge.pdf

Science and Service needed for sanitation and Water Reuse in the Cuvelai-Etoshia Basin.
http://www.sasscal.org/downloads/Outline_Cuvela_%20Sanitation-ISOE.pdf?PHPSESSID=4nd4asohnqhk78cv4irfgprlk4

Status and need for knowledge and skills on the safe use of wastewater

NB: Questionnaires are not yet back to make good conclusions
Generally there is need to raise awareness on safe use of waste water for irrigation. Education the benefits and risks of using wastewater is necessary so that appropriate irrigation systems are adopted depending on the types of crops grown.

References

Lahnsteiner J, Lempert G. 2005. Water Management in Windhoek Namibia.

United Nations Environment Programme (2000) -International Source Book on Environmentally Sound Technologies for Wastewater and storm water management.
http://www.unep.or.jp/Ietc/Publications/TechPublications/TechPub-15/main_index.asp

Water Resources Management Act (2004). Government Gazette of the Republic of Namibia.