Wastewater Production, Treatment, and Use in South Africa

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## Wastewater production and treatment

Wastewater treatment works (WWTWs) design capacity and daily inflows, as reported in Department of Water Affairs (2012). The assessment covered 831 WWTWs in 155 municipalities.

<table>
<thead>
<tr>
<th>Type of plant</th>
<th>No. of WWTWs</th>
<th>Design capacity MI/day</th>
<th>Daily inflow MI/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macro-sized plants, &gt;25 ML/day</td>
<td>63 (8%)</td>
<td>4357.70</td>
<td>3930.26</td>
</tr>
<tr>
<td>Large-sized plants, 10-25 ML/day</td>
<td>66 (8%)</td>
<td>964.80</td>
<td>681.13</td>
</tr>
<tr>
<td>Medium-sized plants, 2-10 ML/day</td>
<td>236 (28%)</td>
<td>1012.39</td>
<td>651.49</td>
</tr>
<tr>
<td>Small-sized plants, 0.5-2 ML/day</td>
<td>243 (29%)</td>
<td>227.62</td>
<td>98.28</td>
</tr>
<tr>
<td>Micro-sized plants, &lt;0.5 ML/day</td>
<td>138 (17%)</td>
<td>28.07</td>
<td>12.53</td>
</tr>
<tr>
<td>Undetermined</td>
<td>85 (10%)</td>
<td>85</td>
<td>350</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>831</strong></td>
<td><strong>6675.58</strong></td>
<td><strong>5373.69</strong></td>
</tr>
</tbody>
</table>

Concern about flows in excess of design capacity at small- and medium-sized WWTWs. Also ageing infrastructure and maintenance of WWTWs.
Wastewater use

- Household wastewater (greywater) use
  Limited implementations in Carnavon (Northern Cape), Kimberley (Free State), eThekwini Municipality (KwaZulu-Natal) – gardens, including food gardens.

- District wastewater use
  Lynedoch Eco-village (Western Cape) – irrigation and toilet flushing.

- Wide-area urban/agricultural use
  eThekwini Municipality (KwaZulu-Natal) – industrial use.
  City of Cape Town (Western Cape) – mainly irrigation by large non-domestic users; groundwater recharge.
Regulations and implementation of guidelines

- Department of Water Affairs
  2001 revision of Water Services Act – precautions
  2004 revised General Authorisation under the National Water Act

- Department of Health
  1978 South African Guide for the Permissible Utilisation and Disposal of Treated Sewage Effluent

- Water Research Commission; Department of Water Affairs
  Guidelines for permissible use of wastewater sludge (2006)

- Water Research Commission
  Guidance for use of greywater in gardens and small-scale agriculture (2010)
Challenges

- Historically, a lack of a culture of reuse.

- Wastewater treatment and effluent quality.

- Available national guidelines for wastewater reuse outdated.
Government’s approach to wastewater management

- **Department of Water Affairs**
  Green Drop programme and targeted risk-based regulation to improve management of WWTWs and effluent quality.

- **Water Research Commission**

- **Water Research Commission**
  National dialogues on water, including wastewater use.

- **Department of Water Affairs**
  Revision of national water resource strategy; water reuse is a key pillar.
Possible solutions

- Develop a culture of wastewater as a resource.
- Revise national guidelines for reuse of wastewater, in line with WHO guidelines.
- Link revision of wastewater guidelines into investigation of possibilities for reuse, especially for non-domestic large-scale users as presently in City Cape Town and eThekwini Municipality.
- Promote responsible reuse of greywater for small-scale users.