Waste Water Treatment and Water Quality Based on UNSD Questionnaire 2002 and 2004

United Nations Statistics Division

Workshop on Environment Statistics

Addis Ababa, 16-20 July 2007
Waste water generation

Total waste water generated

- Agriculture, forestry and fishing
- Mining and quarrying
- Manufacturing Industries
- Production and distribution of electricity
- Construction
- Other economic activities
- Households
Sources of data:

Statistical surveys (agriculture, industries, households)

Administrative sources (waste water discharge permits)

Expert estimates and calculations based on production data and emission coefficients
Emissions of pollutants

In the 2002 Questionnaire there was a \( * \) table on the volumes of selected pollutants emitted in the waste water. The table was later discontinued due to the lack of responses.
Waste water treatment

Types of wastewater treatment processes
1- Mechanical treatment/Primary
2- Biological treatment /Secondary
3- Advanced treatment/Tertiary

Table no. W 4b
1- Waste water treated in public treatment plants
2- Waste water treated in other treatment plants
3- Waste water treated in independent treatment facilities
4- Non treated waste water
5- Total sewage sludge production
Sources of data:

Survey of the waste water treatment industry
Expert estimates and calculations
Access to Waste water treatment facilities
- Population connected to waste water collecting system
- Population connected to waste water treatment
- Population connected to independent treatment (septic tanks)

- Waste water treatment plants
  Design capacity of waste water treatment plants by level of treatment
Sources of data:

Survey of waste water treatment industry
Housing census
Household surveys
Water quality

As part of its biennial environmental data collection, until 2002, UNSD requested annual average water quality statistics for a range of pollutants for a minimum of two of the most polluted rivers, lakes and coastal areas, respectively. Countries were asked to consider their selection of the water bodies in the context of the economic, demographic, and geographic importance as well as in light of the statistical quantity and quality of the available data for the respective waters. For more coherent interpretation of the data, additional meta-information was collected on the location of the monitoring station and the sampling frequency.
Parameters of water quality

Biochemical Oxygen Demand (BOD5)
Dissolved Oxygen (DO)
Chemical Oxygen Demand (COD)
Total Dissolved Solids (TDS)
Total Phosphorus
Total Nitrogen
Faecal Coliform
Chlorophyll-a (Chl-a)
### Key water quality parameters for various water uses

<table>
<thead>
<tr>
<th>Public water supply</th>
<th>Industrial water supply</th>
<th>Agricultural water supply</th>
<th>Aquatic life and wildlife maintenance</th>
<th>Recreation and aesthetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coliform bacteria</td>
<td>Processing (except foods)</td>
<td>Farmsstead: (same as for public supply)</td>
<td>Temperature</td>
<td>Recreation</td>
</tr>
<tr>
<td>Turbidity</td>
<td>pH</td>
<td>Livestock: (similar to that for public supply)</td>
<td>DO</td>
<td>Coliforms</td>
</tr>
<tr>
<td>Colour</td>
<td>Turbidity</td>
<td>Irrigation:</td>
<td>pH</td>
<td>Turbidity</td>
</tr>
<tr>
<td>Taste-odour</td>
<td>Colour</td>
<td>Dissolved solids</td>
<td>Alkalinity/acidity</td>
<td>Turbidity</td>
</tr>
<tr>
<td>Trace metals</td>
<td>Hardness</td>
<td>Specific conductance</td>
<td>Dissolved solids</td>
<td>Colour</td>
</tr>
<tr>
<td>Dissolved solids</td>
<td>Alkalinity/acidity</td>
<td>Sodium</td>
<td>Salinity</td>
<td>Odour</td>
</tr>
<tr>
<td>Trace organics</td>
<td>Dissolved solid</td>
<td>Calcium</td>
<td>Carbon dioxide</td>
<td>Floating materials</td>
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<tr>
<td>Chlorides</td>
<td>Suspended solids</td>
<td>Magnesium</td>
<td>Turbidity</td>
<td>Settleable materials</td>
</tr>
<tr>
<td>Fluorides</td>
<td>Trade metals</td>
<td>Potassium</td>
<td>Colour</td>
<td>Nutrients</td>
</tr>
<tr>
<td>Sulphates</td>
<td>Trade organics</td>
<td>Boron</td>
<td>Floating material</td>
<td>Temperature</td>
</tr>
<tr>
<td>Nitrates</td>
<td>Cooling</td>
<td>Chlorides</td>
<td>Tainting</td>
<td>Aesthetics</td>
</tr>
<tr>
<td>Cyanides</td>
<td>pH</td>
<td>Trace metals</td>
<td>substances</td>
<td>Turbidity</td>
</tr>
<tr>
<td>Radioactivity</td>
<td>Temperature</td>
<td>Hardness</td>
<td>Toxic materials</td>
<td>Colour</td>
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<tr>
<td></td>
<td>Silica</td>
<td>Alkalinity/acidity</td>
<td>Nutrients</td>
<td>Odour</td>
</tr>
<tr>
<td></td>
<td>Aluminium</td>
<td>Sulphates</td>
<td>Substances</td>
<td>Floating materials</td>
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<td></td>
<td>Iron</td>
<td>Dissolved solids</td>
<td>adversely</td>
<td>Settleable materials</td>
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<td></td>
<td>Manganese</td>
<td>Suspended solids</td>
<td>affecting wildlife</td>
<td>Nutrients</td>
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<td></td>
<td>Hardness</td>
<td>Sanitary</td>
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<td>Temperature</td>
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<td></td>
<td>Alkalinity/acidity</td>
<td>(same as for public supply)</td>
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<td>Substances</td>
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<td>affecting wildlife</td>
</tr>
</tbody>
</table>
Table w6: water quality of selected rivers
Table w7: water quality of selected lakes
Table w8: water quality of selected coastal areas
Data sources:

Water quality monitoring networks (water authorities, environmental agencies, health authorities)

International: GEMS Water and EEA