Impacts of wastewater discharge on the quality of water resources and wastewater management

Department of Integrated Management of Environment, Division of Water Resources Management
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Background Information

Water resources of Georgia are divided in two basins:
- Black Sea Basin (West Georgia)
- Kaspian Sea Basin (East Georgia)

INLAND WATER – there is 26060 rivers (total length 59000 km), of which 99% are short (less than 25 km long). These resources are however distributed unevenly, being predominately located in the west.

Main Transboundary tributaries are:
- Mtkvari (Ar, Az, Ge),
- Iori (Ge, Az),
- Alazani (Ge, Az),
- Debet (Ar, Ge),
- Khrami (Ar, Ge, Az)
- Chorokh (Tu, Ge)
Hydrological Network of Georgia
Legislative Base

- Law on Environmental protection
- Law on Environmental Impact;
- Law on Entrepreneur Control;
- Law on State Control of Environmental Protection;
- Technical environmental regalement (enterprises which are not applicants of EIA permits)
- Law on Water:
  - Regulation on the protection of Georgian surface waters from pollution
  - Regulation on water protection zones
  - Methodology on the calculation on Maximal Admissible Discharges of pollutants in the wastewater discharged to the surface water
Responsibility for the wastewater and surface water quality

Water Resources Management Division (Department of Integrated Management of Environment)
- Implements governmental policy of water protection and pollution prevention;
- Establishes maximum allowable concentration for waste water discharges;
- Conducts state inventory of water use and wastewater.

National Environmental Agency
Monitors of surface water quality and quantity

Inspection of Environmental Protection
Controls of state of water pollution

Service of License and Permits
Issues permits for impacts on the environment, which includes approved maximum allowable concentration for water discharge
State Environmental Inspection

- There is no systematic control of wastewater discharges, (Law on Entrepreneur Control)

  But:

- In accordance with the Strategy of the Environmental inspection for 2007-2010 years:

- In 2007, it will carry out a full inventory of the regulated community and develop a package of guideline documents on state enforcement. This will allow the Inspectorate consistent and integral performance of their tasks; Training for Inspectorate staff; Establishment of information-communication system.

- In 2008, it will continue with staff training and, at the same time will conduct a full inventory of the environmental problems existing in all sectors of economical activities and will give preference to preventive measures. This phase could be characterised as a “institutional development and tolerance” phase in the Inspectorate’s strategy;
In 2009 and 2010, the focus will be shifted to inspection and a zero tolerance approach towards violations will be gradually adopted.

There is already developed the draft Law on Inspection of Environment Protection, which will allow inspectorate to implement above mentioned activities.
Reveal of the violations in the field of the water resources:
Department of Integrated Management of Environment Water Resources Management Division

- Implements governmental policy of water protection and pollution prevention;
- Establishes and adopts maximum allowable concentration for waste water discharges and assess plans of environmental impact mitigation activities in the field of water resources (MAD and EIA reports);
- Conducts state inventory of water use and wastewater.
Water Use

Water use in total  29756 mln.m³
- Drinking water supply
- Hydropower
- Industry
- Irrigation
Wastewater Discharge

Wastewater discharge

years

0 5000 10000 15000 20000 25000 30000

2006 2007 2008
Problems of Wastewater Discharge:

- **Main polluters:**
  - Municipal wastewater – 67%
  - Thermal Power stations – 31%
  - Industry – 2%
  - Pollution from the illegal landfills

Agricultural lends
(non point sources of pollution)

**Main pollutants are:**
- Nitrogen compounds
- BOD
- Suspended Solids
## Waster Discharges by the Activities

<table>
<thead>
<tr>
<th>Activities</th>
<th>water users in total</th>
<th>Discharge Untreated discharge water do not needed treatment</th>
<th>treated water</th>
<th>loses in transportation</th>
<th>water reuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Georgia totally Main activities:</td>
<td>800</td>
<td>614.147</td>
<td>28461.560</td>
<td>13.846</td>
<td>436.604</td>
</tr>
<tr>
<td>Agriculture</td>
<td>38</td>
<td>0.073</td>
<td>19.826</td>
<td>0.010</td>
<td>180.069</td>
</tr>
<tr>
<td>Irrigation</td>
<td>27</td>
<td>0.062</td>
<td>19.826</td>
<td></td>
<td>180.069</td>
</tr>
<tr>
<td>Fishery</td>
<td>70</td>
<td>1.847</td>
<td>4.841</td>
<td>1.575</td>
<td>0.191</td>
</tr>
<tr>
<td>industry</td>
<td>303</td>
<td>1.317</td>
<td>7.094</td>
<td>9.228</td>
<td>1.151</td>
</tr>
<tr>
<td>Food production</td>
<td>90</td>
<td>0.094</td>
<td>3.813</td>
<td>0.012</td>
<td>0.224</td>
</tr>
<tr>
<td>Industry</td>
<td>15</td>
<td>0.109</td>
<td>0.787</td>
<td>0.343</td>
<td>74.114</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>3</td>
<td>7.038</td>
<td>0.579</td>
<td>11.288</td>
<td></td>
</tr>
<tr>
<td>Energy power</td>
<td>38</td>
<td>255.704</td>
<td>28429.770</td>
<td>0.004</td>
<td>10.932</td>
</tr>
<tr>
<td>Water supply and sanitation</td>
<td>126</td>
<td>353.898</td>
<td>0.026</td>
<td>0.352</td>
<td>244.079</td>
</tr>
</tbody>
</table>
## Main Industrial Enterprises

<table>
<thead>
<tr>
<th>Water Users</th>
<th>Water discharge (thous.m³)</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. &quot;Madneuli&quot;</td>
<td>357.42</td>
<td>Mining</td>
</tr>
<tr>
<td>2. “WiaTurmanganumi”</td>
<td>4620.2</td>
<td>Mining</td>
</tr>
<tr>
<td>3. Mtkvari-energy (e.i.s. &quot;mtkvari&quot;)</td>
<td>309.1</td>
<td>Thermal power</td>
</tr>
<tr>
<td>4. “BaTumi oil terminal”</td>
<td>3300.878</td>
<td>Receive and transportation of oil products</td>
</tr>
</tbody>
</table>
Wastewater treatment
Treatment of Municipal Wastewater

- Wastewater discharge systems operate in 41 cities and districts, 30 of which have wastewater treatment plants of total design capacity equal to 1,6 mil. m³ a day.
- Alarming problems exist in collection and treatment of domestic sewage and industrial wastewater. About 80% of pollution comes from municipal sewage systems.
- Most of wastewater treatment facilities has become disabled, and the wastewater is discharged untreated to the open water bodies and therefore ultimately causes contamination of rivers.
## Municipal Wastewater Treatment Plants

<table>
<thead>
<tr>
<th>Town</th>
<th>Technology</th>
<th>Operational Since</th>
<th>Design Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Black Sea Basin</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kutaisi</td>
<td>MB</td>
<td>1980</td>
<td>Out of order</td>
</tr>
<tr>
<td>Batumi</td>
<td>MB</td>
<td>1983</td>
<td>there is already designed new plant</td>
</tr>
<tr>
<td>Kobuleti/Ozurgeti</td>
<td>MB</td>
<td>1985</td>
<td>Out of order</td>
</tr>
<tr>
<td>Poti</td>
<td>M</td>
<td>1981</td>
<td>Out of order</td>
</tr>
<tr>
<td>Sachxere</td>
<td>MB</td>
<td>2007</td>
<td>full operating</td>
</tr>
<tr>
<td><strong>Mtkvari River Basin</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tbilisi/Rustavi</td>
<td>MB</td>
<td>1986</td>
<td>Mechanical only In accordance of president</td>
</tr>
<tr>
<td>Gori</td>
<td>MB</td>
<td>1968</td>
<td>Out of order</td>
</tr>
<tr>
<td>Telavi</td>
<td>MB</td>
<td>1975</td>
<td>Out of order</td>
</tr>
<tr>
<td>Kaspi</td>
<td>M</td>
<td>1978</td>
<td>Out of order</td>
</tr>
<tr>
<td>Bakuriani</td>
<td>MB</td>
<td>1978</td>
<td>Out of order</td>
</tr>
<tr>
<td>Dmanisi</td>
<td>MB</td>
<td>1983</td>
<td>Out of order</td>
</tr>
<tr>
<td>Abastumani</td>
<td>MB</td>
<td>1981</td>
<td>Out of order</td>
</tr>
<tr>
<td>Tetrithkaro</td>
<td>MB</td>
<td>1981</td>
<td>Out of order</td>
</tr>
</tbody>
</table>
Points of Surface Water Monitoring
Quality of rivers: Mtkvari river

- Ammonium Nitrogen
- Bio-Oxygen Demand
- Nitrate Nitrogen
- Nitrite Nitrogen

Max of concentration

Lab station ID
date

Mtkvari Khertvisi
Mtkvari Gachani
Tbilisi

Parameter

9.24.2008
8.31.2008
7.23.2008
6.26.2008
5.22.2008
4.23.2008
3.26.2008
2.24.2008
1.24.2008
5.16.2007

River Mashavera

![Graph showing the maximum concentration of different parameters at various dates along the Mashavera river.](image-url)
International issues

All International projects mainly aims to the improvement of monitoring system and Surface Water Quality Standards:

- **Water governance in the Western EECCA Countries**
  Revision of Surface Water Quality Standards and Development of Emission Limit Values (ELV) in accordance with international requirements;

- **Trans-Boundary River Management Phase II for the Kura River basin – Armenia, Georgia, Azerbaijan**
  Support the establishment of transboundary monitoring and information management system to improve transboundary cooperation in Kura River Basin;
  Enhance capacities of environmental bodies engaged in long-term integrated water resources management in Kura River basin.
  Elaboration of Pilot River Basin Management Plans for the Alazani river and the Aragvi river

- **Environmental Collaboration for the Black Sea**
  Elaboration of the new draft Law on Water
Steps Already Undertaken

- Black Sea costal zone, Kutaisi and Bolnisi regions are defined as priority areas of hot spots
- Rehabilitation process of water supply and sanitation system for towns: Batumi, Poti, Kutaisi, Kobuleti, is under way;- (Agency of Water Supply, Ministry of Regional Development and Infrastructure)
- Between MOE and some large enterprises was signed Memorandum of Intents aiming at implementation of the environmental safety program.
- Improvement of Environmental Legislation and harmonization with EU Directives has already started
Thank you for your attention!