16th meeting of the EUWI EECCA Working Group

**Impacts of climate change on water resources in Moldova and possible adaptation measures.**
**Trans-boundary cooperation in adaptation in the Dniester river basin**

Geneva, 02 July 2012

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Sonja Koeppel, UNECE
• European Union Water Initiative NPD in Moldova
• Climate change in Moldova
• Impacts of climate change on water resources and on WSS
• Possible adaptation measures: general and WSS-specific
• UNECE/ ENVSEC project: Reducing vulnerability to extreme floods and climate change in the Dniester basin
EUWI NPD in Moldova in 2006-2012

On WSS:
- The second phase (2009-2010) was devoted to developing a mid-term Action and Investment plan.
- The ongoing 3rd phase: developing an adaptation strategy for WSS to make it more resilient to climate change, and on sustainable business models for sanitation in small towns and villages in Moldova.

On IWRM:
- In 2006-2008: several policy packages (e.g. wastewater discharges, on river basin management authorities, etc.;
- In 2009-2010 the dialogue focused on the setting up of targets and target dates on water and health under the Protocol on Water and Health.
- In 2012-2013: Action plan for the targets.
• Over the past 120 years, average T increased by some +1°C.
• Over the last 66 years, the amount of precipitation in the northern and central part of the country has risen up to 11%, while in the Southern part of the country the amount of precipitation has decreased by 1.2%, to 658, 569 and 514 mm per annum, respectively.
The number of anomalousic events increases.

The number of extreme weather events such as floods or windstorms, extreme temperature and droughts has increased substantially since 2001.
Impacts on water resources

- **Surface water quantity** (projection): no significant change in the annual flow, but peak flows will be some 20-30% higher (hence higher risk of floods), due to lower number of rainy days

- **Surface water quality**, e.g. 2007 drought: an increased content of Ammonium (NH₄) and a low content of Nitrates (NO₃) and Dissolved Oxygen

- **Ground water**, e.g. 2007 drought: 80% of shallow wells had a significantly reduced water level and productivity, while 20% dried up completely!

- **High uncertainty remains plus Data problem**:  
  - lack of data on water quality (or not reliable data)  
  - not enough automatic hydro-posts
Data resolution problem: to assess peak flows during floods, data on daily/hourly flows is needed, while only data on monthly (!) flows is available!
## Illustration 2: 2007 drought

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Rayon</th>
<th>Number of existing shallow wells</th>
<th>Number of completely dried up wells</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bocancea Schit</td>
<td>Singerei</td>
<td>7</td>
<td>7</td>
<td>100%</td>
</tr>
<tr>
<td>Cioropcani</td>
<td>Unghen</td>
<td>189</td>
<td>60</td>
<td>32%</td>
</tr>
<tr>
<td>Copance</td>
<td>Causeni</td>
<td>35</td>
<td>35</td>
<td>100%</td>
</tr>
<tr>
<td>Onitcani</td>
<td>Criuleni</td>
<td>14</td>
<td>14</td>
<td>100%</td>
</tr>
<tr>
<td>Bulhac</td>
<td>Riscani</td>
<td>31</td>
<td>15</td>
<td>48%</td>
</tr>
<tr>
<td>Dolinnoe</td>
<td>Criuleni</td>
<td>100</td>
<td>78</td>
<td>78%</td>
</tr>
<tr>
<td>Tirnova</td>
<td>Donduseni</td>
<td>493</td>
<td>251</td>
<td>51%</td>
</tr>
<tr>
<td>Tintareni</td>
<td>Anenii Noi</td>
<td>110</td>
<td>110</td>
<td>100%</td>
</tr>
<tr>
<td>Mirnoe</td>
<td>Taraclia</td>
<td>15</td>
<td>12</td>
<td>80%</td>
</tr>
<tr>
<td>Ecaterinovca</td>
<td>Cimisla</td>
<td>37</td>
<td>30</td>
<td>81%</td>
</tr>
<tr>
<td>Ghindesti</td>
<td>Floresti</td>
<td>85</td>
<td>70</td>
<td>82%</td>
</tr>
<tr>
<td>Costesti</td>
<td>Ialoveni</td>
<td>420</td>
<td>270</td>
<td>64%</td>
</tr>
</tbody>
</table>
Possible adaptation measure

• **General:**
  - Establish integrated water resource management (IWRM)
  - Introduce disaster and climate risk assessment
  - Establish of a proper flood management (EIB project), etc.

• **WSS-specific (focus on “no regret” measures):**
  - Water and sanitation development/master plans based on the water resource inventory on river basin level
  - Promote efficient water use (water demand management plans and various incentives, reducing leakages etc.)
  - Upgrading existing and properly functioning WSS facilities and protecting them against flooding and direct impact of the increased river flow, etc.

• **These measures will be further assessed and adaptation strategy for WSS developed by the end of 2012** (EC (DG ENV) and OECD–sponsored project implemented through the ongoing EUWI NPD)
Project: Reducing vulnerability to extreme floods and climate change

- **Background:** Most rivers in Moldova are transboundary. 2.7 million Moldovans live in the Dniester basin. Transboundary cooperation in adaptation is necessary to prevent negative impacts of unilateral measures and increase effectiveness of adaptation.

- **Dniester III floods and climate project** implemented by UNEP, UNECE and OSCE under ENVSEC in 2010-2012, within the Dniester III project and as part of the Water Convention programme of pilot projects.

- **Aims:**
  - reduce risks from climate change - and specifically flooding - by improving adaptive capacity of both countries
  - expand and further strengthen cooperative management to address cross-border management of floods.
Nearly completed activities

- First basin-wide climate impacts assessment and vulnerability assessment
  - Analysis and projection of climate change impacts
  - Analysis of climate change impacts on water resources
  - Integrated vulnerability analysis
Nearly completed activities

- Modelling and mapping of flood risks in selected areas
  - Modelling of extreme flood scenarios
  - Geoinformation support and flood mapping
  - Survey of channel/floodplain topography

- Inauguration of a boat funded through the Dniester III project for Moldovan fisheries services (8 June 2012)
Mogilev-Podolsky (Ukraine)- Ataki (Moldova)

Dubossary (Moldova)- Mayaki (Ukraine)
Ongoing/planned activities

- Improved / new automated flow monitoring stations and data exchange infrastructure
- Enhanced capacities and plans for flood risk communication on the sub-basin / local level
- Agreement and planning of further measures for flood risk reduction - preparation of adaptation strategy/ plan

> Cooperation/ coordination with national activities ensured through working group
Some first lessons learnt

• In Ukraine and Moldova climate change impact assessments had been done nationally, but with different methodologies and thus different results—importance of joint scenarios, modelling and vulnerability assessment

• Importance of thorough baseline study to identify completed or ongoing projects and relevant partners to be involved

• Importance of link between political and experts’ level, e.g. through creation of a working group and regular meetings

• Importance of concrete activities and involving population

THANK YOU FOR YOUR ATTENTION!