Nitrogen challenges in Central Asia – experiences linking the Air and Water Convention

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LRTAP Convention Secretariat

10th TFRN meeting, Lisbon, 29 April 2015
1. Emission trends

2. Amendments to the Gothenburg Protocol

3. Nitrogen challenges in Central Asia

4. Assessments under the UNECE Water Convention in Central Asia

5. Institutional challenges and capacity building
1. Emission trends

- EU-28 emission trends for main pollutants, 1990-2012

source: EU IIR, 2014
Main emitting sectors: NOx and NH₃

Source: ibid
2. Amendments to the Gothenburg Protocol

- **Protocol to Abate Acidification, Eutrophication, Ground-level Ozone (Gothenburg Protocol) in May 2012**
  - Emission ceilings for 2020 (compared to 2005 base year) for key air pollutants: sulphur and nitrogen oxides, ammonia, PM and VOCs
  - Flexibilities for new Parties
  - Entry into force when 2/3 of its 26 Parties accept the amendments
  - EU, Belarus, Norway and Switzerland emission reduction commitments
  - Guidance document on national nitrogen budgets
  - Guidance document on preventing and abating ammonia emissions from agricultural sources
  - Revised Ammonia Framework Code
3. Nitrogen challenges in Central Asia

Source: FAOSTAT (use of combined mineral fertilizers may not be included)
Tajikistan: transitional period

Source: Tajikistan national statistics, David Sedik, FAO (2009)
Figure 4. Livestock inventories by farm type, 1980-2007 (‘000 standard cow head).

Nitrogen consumption in Central Asia

Source: FAOSTAT

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<th>Year</th>
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<td>2012</td>
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<td>2011</td>
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<td>2010</td>
<td>617.794</td>
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<td>2009</td>
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<td>2008</td>
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Organic fertilizers application

Kazakhstan organic fertilizers use (1000 t)

Source: Kazakhstan national statistics
Social and economic considerations

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Source: UNECE statistics
Challenges

- Wastewater treatment
- Access to sanitation and drinking water
- Water quality in major rivers (mineralization)
- Transport emissions
4. Assessments under the Water Convention

Among the Water Conventions obligations regular assessments of transboundary waters; decisions of the Parties in 2003 about regional assessments (2007, 2011)

Findings:

- Frictions between sectors about water use in many basins
- Policy integration and coherence remains weak across the region; difficult to put into practice, painful trade offs. Stronger governance needed!

High demand in the countries for effective, practical solutions for alleviating negative impacts between sectors

Little done about the nexus at transboundary level
Assessment of the water-food-energy-ecosystems nexus in selected basins

Part of the Convention’s Work Programme 2013-2015, and possibly beyond

Work overseen and guided by the Task Force on the Water-Food-Energy-Ecosystems Nexus

Up to 6 basins to be assessed – pan-Europe, Africa, Asia; different nexus settings, climate, resource scarcity etc.

Key partners: Finland (lead)/Finnish Environment Institute SYKE, FAO, Royal Institute of Technology (Stockholm)

Sava and the Syr Darya worked on; other in preparatory stages
Why a Water-Food-Energy-Ecosystems Nexus in transboundary river basins?

Need to integrate/coordinate:

1. A better understanding of inter-sector and inter-resources dynamics allows accounting for impacts & more effective resource management

2. To make policies and actions more coherent across sectors and countries

Communication, collaboration and joint action!
Substantive elements of the approach

1. A survey with a factual questionnaire for a preliminary identification of the main pressures and hotspots
2. A desk review of the available documentation
3. A participatory workshop at transboundary level, with the economic sectors and other stakeholders to identify the inter-sectoral linkages and trade-offs & possible synergic actions
4. Indicator based analysis. Limited quantification. Institutional analysis
5. Preparation of nexus assessment report with the analysis i.e. Sectoral characteristics including development options; Inter-sectoral linkages and priority issues; Qualitative future scenarios (trends, climate change); Potential solutions identified, policy recommendations

=> basis for a later quantitative trade-off analysis (depending on the countries interest & availability of donor funding)
**BETTER SOIL AND WATER QUALITY**

**INDUSTRY/ MINING**

- Improve environmental management in industry/mining

**HEALTHIER ECOSYSTEMS**

**LESS SALINIZATION**

**LESS MINERALIZATION**

**ECOSYSTEM SERVICES**

- Improve wastewater treatment
- Improve drainage and irrigation

**WATER**

**LAND USE**
Nexus for Alazani/Ganikh river

NEXUS for the Alazani/Ganikh basin: Status

Water
- Hydropower has the highest share of water use: flood protection, irrigation potential for agriculture
- Groundwater extraction for Baku and local use
- Agriculture is the most important sector in the basin
- Extensive irrigation schemes

Environmental Assets
- High-value biodiversity
- Flood protection
- Forested potential for wood and fish production
- Soil salinity caused by irrigation and substances in the water
- Water quality affected by use of fertilizers, nutrients, and pesticides

Energy
- No large-scale wastewater treatment
- Water pumping and transport for Baku and local use
- Pumping systems for irrigation schemes
- Medium level of mechanization

Food & Land
- Very little competition between land use for energy and food production
- Irrigated agriculture
- Livestock and crops

Map of the Alazani/Ganikh basin showing top agricultural commodities and other issues.
SOIL AND WATER QUALITY IMPROVEMENTS

Change of agricultural practices
- Improve drainage, reduce water logging
- Crop rotation and diversification to build up soil matter
- Conservation tillage
- Contour farming

Capture and treat wastewater
Reduce fertilizer and pesticide input and hence, agricultural run-off
5. Institutional challenges and capacity building

- Emission inventories (only Kyrgyzstan provided NOx and NH3 inventory)
- Build understanding of N flows and main pollution sources
- Improve transboundary cooperation
- Capacity building under LRTAP
- Targeted engagement with farmers
Thank you for your attention!

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