

Development of renewable energy: opportunities from applying a water-energy-food-ecosystems nexus approach

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Towards better policy coherence: assessment of intersectoral links, trade-offs and benefits



- A series of intersectoral assessments of the “nexus” considering water resources, energy, land/agriculture and ecosystems has been carried out under the UNECE Water Convention (<http://www.unece.org/env/water/publications/pub>)
- The specifically designed participatory assessment methodology which involves application of fit-for-purpose tools adapts to the context and the specific issues; application to 5 transboundary basins demonstrates value for engaging different sectors into a dialogue
- Task Force on the Water-Food-Energy-Ecosystems Nexus guides the work; provides oversight and a forum for exchanging experience
- Cooperation with GERE shaping the energy aspects: the Drina assessment, promotion and outreach, understanding energy sector concerns, finding a balance between development and the environment

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Transsərhəd hövzələrdə ehtiyatlardan istifadənin tənzimlənməsi: su, ərzaq, enerji və ekosistemlər arasında əlaqənin dəyərləndirilməsi adlı nəşrdən çıxarış

5-Cİ FƏSİL
Alazani / Qanix çayının hövzəsi
(Azərbaycan, Gürcüstan), İsmail



Deployment of Renewable Energy:

The Water-Energy-Food-Ecosystems Nexus Approach
to Support the Sustainable Development Goals

Good practices and policies for intersectoral
synergies to deploy renewable energy



New policy brochure to highlight opportunities for development of RES from intersectoral synergies

- Fora on Energy For Sustainable Development: Early draft as an official GERE document in Baku (2016); Brochure launched in Astana (2017)
- Describes nexus and the RES, Tools supporting identification of intersectoral synergies, good practices (focus on innovation), transboundary basin case studies (illustrating concrete synergy opportunities)
- Developed under UNECE Water Convention in cooperation with GERE
- Calls for integrating intersectoral links and synergies between 1) developing RES and 2) use & protection of water resources and the environment, into energy policies and investment plans

Renewable energy contribution in the different parts of the water-energy-food-ecosystems nexus

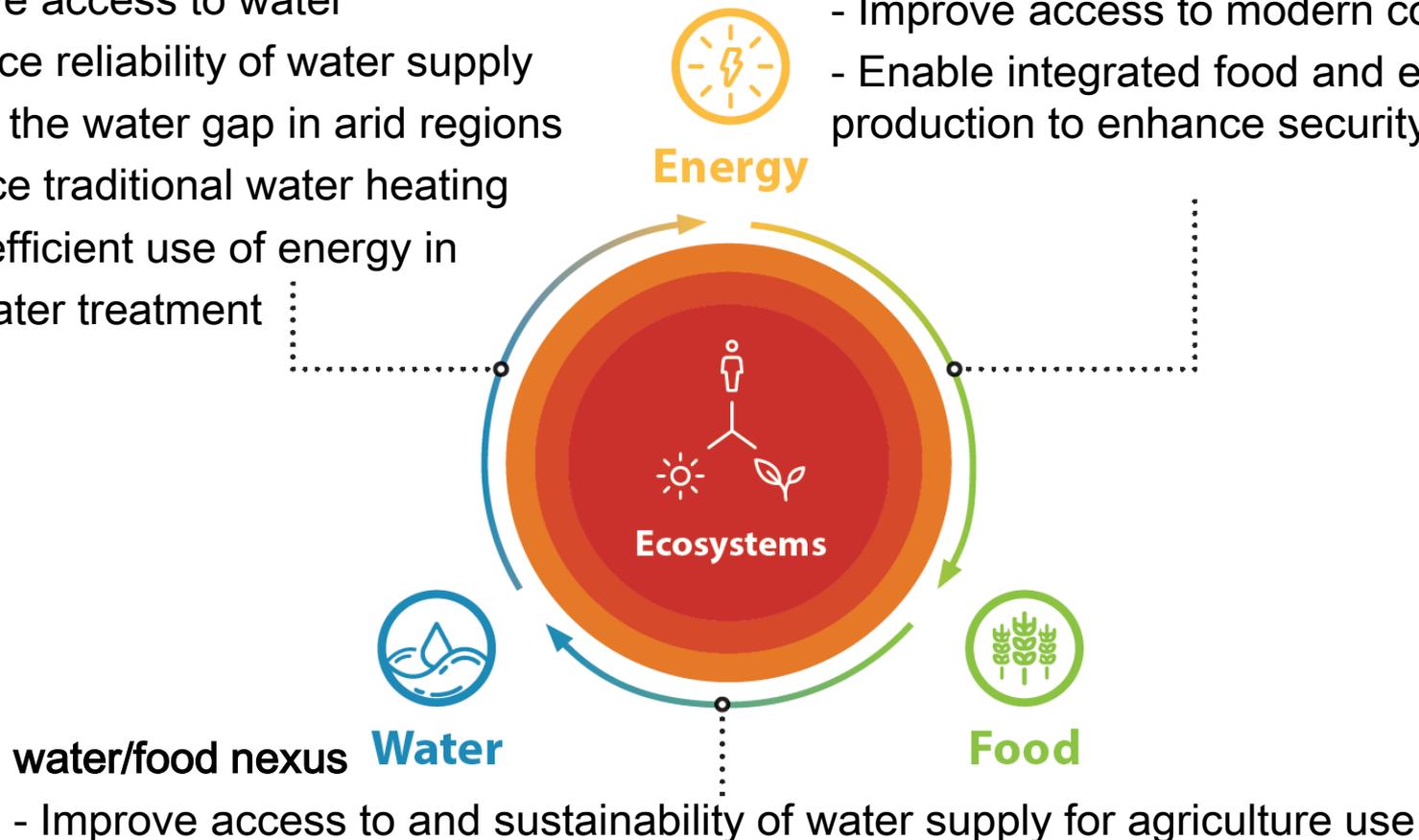


Energy/water nexus

- Reduce water-intensity of power sector
- Improve access to water
- Enhance reliability of water supply
- Bridge the water gap in arid regions
- Replace traditional water heating
- More efficient use of energy in wastewater treatment

Energy/food nexus

- Decouple agrifood chain from fossil fuels
- Reduce post-harvest losses
- Improve access to modern cooking fuels
- Enable integrated food and energy production to enhance security



water/food nexus

- Improve access to and sustainability of water supply for agriculture use

Nexus opportunities - examples from transboundary basins

All demonstrate the value of cooperation



Sava & Drina

Develop hydropower sustainably and integrate other renewable energies; coordinate operation of hydropower plants (for flood control, for energy system benefits) and development of new capacities

Alazani/Ganykh

Facilitate access to modern energy sources and energy trade; minimize impacts from new hydropower development; catchment management to control erosion

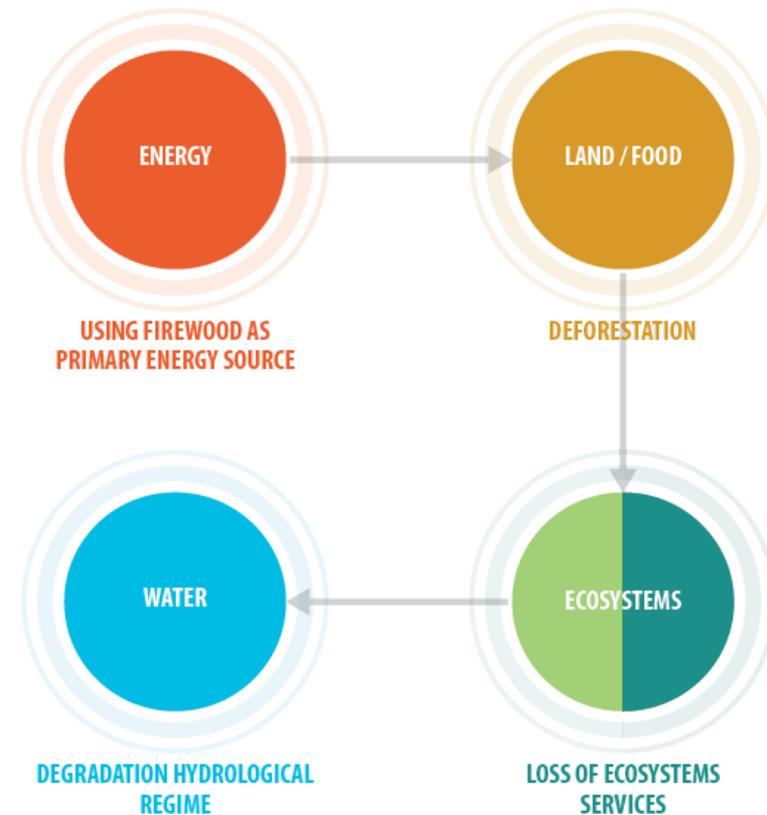
Syr Darya

Promote restoring and vitalizing energy market, develop the currently minimal trade in agricultural products; improve efficiency in energy generation, transmission and use; improve efficiency in water use (esp. in agriculture)

Main intersectoral issues in the Alazani/Ganykh Basin

Energy sector policy and action in a key role in the possible response:

Target setting and development of the normative frameworks are expected to facilitate investment into different renewable energy sources. A *strengthened consultation of multiple stakeholders* would help ensure finding the best options, setting priorities and using resources efficiently. *International experience* through the application of guidelines and good practices would help to improve sustainability in the location, design and construction of hydropower plants.



Drina River Basin (Bosnia and Herzegovina, Montenegro, Serbia)



1. Addressing hydropower related challenges

a) Among the **challenges related to flow regulation**:

- Limited cooperation in the operation of hydropower dams.
- Uncertainty on the impacts of hydropower expansion on the flow regime and downstream uses.
- Environmental flow regulation and impacts on electricity production.

b) Several **scenarios** were investigated by KTH using modelling: Base=non-cooperative operation of HPPs Cooperative planning , opportunities from improved trade and inter-connections, energy efficiency.

c) Potentially **substantial benefits** from coordination: . The results suggest that cooperative operation of hydropower dams could deliver more than 600 GWh of electricity over the 2017-2030 period.

d) **Some solutions**: Develop a formal agreement for the coordination of operation of hydropower plants, and support this by setting up a contact group; Improve hydro-meteorological monitoring and early warning; Develop non-hydro renewable energy infrastructure; coordinate investments at the basin level; remove national obstacles to efficient regional capacity allocation etc.

Drina River Basin (...)

2. Challenges and opportunities in relation to non-hydro RES



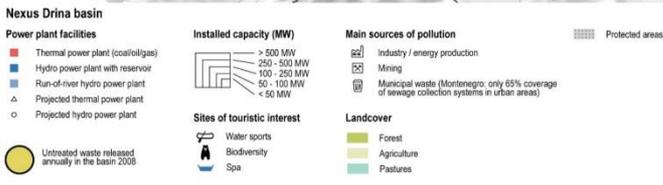
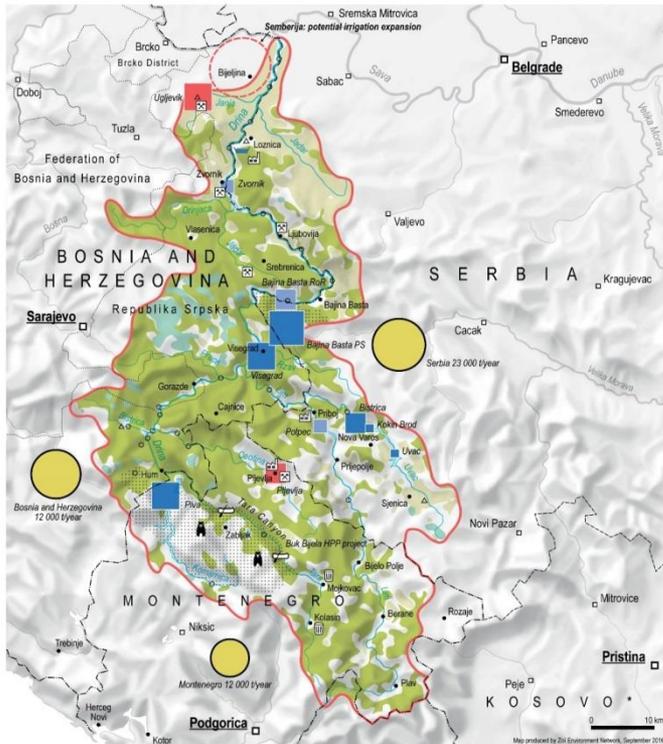
- High dependence on Hydro and coal for electricity generation.

Interest from the countries to diversify the energy generation mix, but **difficulties experienced in securing investments in non-hydro RES**. The diversification of the electricity generation mix through the **deployment of non-hydro RES** could:

a) play an important role on **balancing this dependence**, either by attenuating discharges from hydropower plants or by potentially decreasing investment requirements in conventional energy sources.

B) contribute to the **achievement of national RES targets** and meeting the **international commitments (i.e INDCs)**.

Solutions: Assess potential for RES, including biomass and solar; demand in tourism and agriculture/rural development



Sources: World Bank, Support to Water Resources Management in the Drina River Basin, Final Reaction Report, 2010; European Environment Agency, Corine Land Cover 2000 (2014); Pollution in the Drina River Basin, The Regional Environmental Center for Central and Eastern Europe (REC), 2011
* This information is without prejudice to positions on status, and is in the light of UN Security Council 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Possible ways forward

- Overlooking trade-offs with the environment or other water uses in energy sector development is bad for business. **Taking the synergies and impacts into account in planning and developing strategies can bring about wider application and acceptance to renewable energy**, also hydropower where the trade-offs may be more prominent.
- **Tools** for promoting intersectoral coordination can help reconciling interests:
 - Nexus assessment with fit for purpose tools
 - Strategic environmental assessment and environmental impact assessment in a transboundary context
 - National environmental standards
 - Policy guidelines for promotion of renewable energy
- New partnerships and financing models needed for RES. Enhanced transboundary intersectoral cooperation opens opportunities. Can GERE contribute **identification, dissemination and application of good practices**?
- **Opening investment discussions to a broader set of stakeholders and co-riparian countries' representatives** for more coordinated approaches to RES development? An opportunity for making the Hard Talk concept evolve?
- **Synthesis document** on assessing and addressing the nexus in transboundary basins to be developed by October 2018. Can GERE support addressing the energy sector?

More information: <http://unece.org/env/water>; <http://www.unece.org/env/water/nexus.html>

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