Assessment of the Water-Energy-Food-Ecosystems Nexus in Albania

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Outline

- Study background
- Scope of the Assessment
- Nexus related interlinkages
- Identification of priority interlinkages
- Shortlisted of proposed interventions

Study Background

Achieving climate resilience while ensuring water- energy- and food-security are key preconditions for achieving the economic growth, human prosperity and healthy ecosystems of the country.

A traditional, fragmented approach, attempting to achieve resource security independently, would not only be sub-optimal, but could also endanger sustainability and security in one or more of the other sectors.

The Nexus calls for an integrated and coherent approach in the design and prioritisation of policy options, management practices and infrastructure planning

Significant advancements, especially regarding institutional settings, have taken place in recent years in Albania, however non-integrated and non-coordinated policies and practices remain a substantial challenge in Albania.

Scope of the Assessment

The Assessment aims to assist in addressing this need by applying a Nexus approach to identify **trade-offs** and **synergies** across the Nexus-related sectors, including among others, those in relation to gaps in terms of institutional settings, policy integration and data management.

Policy and Strategic documents

WATER

- The Integrated Water Resource Management Strategy
- The Draft National Sectoral Programme on Water (NSPW).
- National Strategy of the Water Supply and Sewerage Sector 2020-2030.

ENERGY

- The National Energy Strategy for Albania 2018-2030.
- The Consolidated National Renewable Energy Action Plan.
- National Energy Efficiency Action Plan.
- National Energy and Climate Action Plan.

AGRICULTURE

- The new Strategy for Agriculture, Rural Development and Fisheries (SARDF) 2021-2027.
- The National Strategy for Irrigation and Drainage.

ENVIRONMENT

- National Climate Change Strategy and Plan (NCCS&P) for Mitigation of GHG Effects and Adaptation to Climate Change.
- Strategic Policy Paper for Biodiversity Protection.
- Policy Paper for Forests 2019-2030.

Extract from mapping of sectoral Policy Objectives

SECTOR	POLICY OBJECTIVES	INSTRUMENTS
WATER RESOURCES	**WR1** - Improving data gathering and data reliability; **WR2** - Improving Institutional cooperation; **WR3** - Improving water quantity and quality;	**1.**Proper Implementation of Integrated Water Resource Management strategy. **2.-** Completion of River Basin Management Plans; **3.** Proper Implementation of existing River Basin Plans; **4.** Diversification of water permits based on water quality required by different water use sectors. **5.** Coordination of water monitoring Institutions.
FOOD / AGRICULTURE	**WF1 -** Increment of the productivity, profitability and sustainability of irrigated agriculture; **WF2 -** Improving the quality of irrigation and drainage services, fishing, aquaculture and reducing the consequences of floods and drought; **WF3 -** Agriculture land and farm consolidation; **WF4 -** Increasing water for agriculture purposes; **WF5** - Strengthening / proper operation of Water User Organisation and Irrigation and Drainage Units in Municipalities;	**1.**Proper implementation of National Strategy for Drainage and Irrigation 2019-2030; **2.**Providing sufficient funds for feasibility studies and designs of drainage and irrigation network; **3.**Providing sufficient funds for technical assistance to the local authorities and WUOs; **4.** Providing sufficient funds for technical assistance and equipment to the Drainage Boards for river protection and drainage infrastructure.

Degree of cross-sectoral integration

Integration Between Water Sectors	Degree
Water integrates Energy	Medium
Water integrates Food/Agriculture	Low
Water integrates Ecosystems	Medium
Energy integrates Water	Low
Energy integrates Food/Agriculture	Low
Energy integrates Ecosystems	Low
Food/Agriculture integrates Water	High
Food/Agriculture integrates Energy	No
Food/Agriculture integrates Ecosystems	High
Ecosystems integrates Water	Low
Ecosystems integrates Energy	No
Ecosystems integrates Food/Agriculture	Low

Extract from mapping of Interlinkages

Policy Objectives – Food / Agriculture		Key interlinkages with each respective sector			
		Water Resources Management	Water Supply and Sanitation	Energy	Environment / Ecosystems
A1	Increased productivity and sustainability of irrigation through land and farm consolidation as an opportunity for contemporary agriculture.	Water availability is increased.	Water availability for water supply is increased.	Potential for reduction in energy demand for irrigation. Potential for on-site renewable energy installations (e.g. agro-photovoltaics).	By using sustainable practices in agriculture and irrigation, the volume of pesticides used is reduced, and water quality and biodiversity is preserved.
A2	Improving types of irrigation and drainage services, fishing and aquaculture reducing consequences of flooding and droughts.	Impacts of floods/droughts are mitigated.	Water availability for water supply is increased.	Increased energy demand for additional drainage services.	Reduced impact of flooding and droughts.
A3	Strengthening of irrigation/drainage administration, including Water Users Organisations.	Improved efficiencies in water resources management and operations.			Improved governance could lead to improved water quality.
A4	Feasibility studies for irrigation infrastructure, drainage and flood protection / Cleaning of main and secondary drainage canals / Forestation and prevention of soil erosion.	Improved efficiencies in water resources management and operations. .	Forestation may lead to improved water quality.	Improved energy efficiency in irrigation and drainage. Addressing soil erosion reduces sedimentation in reservoirs.	Reduced impacts of flooding and droughts. Land restoration.
A5	Rehabilitation of 14 drainage pumping stations (hydrofoils) in the Western region.	Impacts of floods mitigated. Protection of groundwater.		Increased energy demand.	

Key Interlinkages per sector

Water Supply and Sanitation

Policy Objectives	Synergies	Trade-offs
Expanding and improving access to water & sanitation services / Construction of wastewater treatment plants.	**Agriculture:** Potential for more (treated) water available for irrigation, and use of treated sludge. **Energy:** Potential for energy recovery (biogas) and/or on-site renewable energy installations. **Environment:** Reduced pollution – improved water quality.	**Energy:** Increased energy demand for pumping and water treatment.
Full recovery of operating and maintenance costs / Improved Corporate Governance and capacities.	**Water resources:** Improved performance and overall operations will result in increased efficiencies and reduced water losses. **Energy:** Improved energy efficiency is a prerequisite for the financial sustainability of utilities.	

Food / Agriculture / Land use

Policy Objectives	Synergies	Trade-offs
Improvement of irrigation and drainage services and infrastructure, reducing the consequences of flooding & droughts.	**Water resources management:** Impacts of floods/droughts are mitigated. **Energy:** Potential for increased energy efficiency and/or on-site renewable energy installations (e.g. agro-photovoltaics). **Environment**: Potential for sustainable practices reducing use of pesticides, preserving water quality and biodiversity.	**Energy:** Increased energy demand for additional irrigation and drainage services and equipment.
Forestation and prevention of soil erosion.	**Energy:** Addressing soil erosion reduces sedimentation in reservoirs. **Environment:** Land restoration objectives. **Water supply:** Forestation may lead to improved water quality.	

Energy

Policy Objectives	Synergies	Trade-offs
Sustainable hydropower development.	**Water resources management:** Improved flood management from coordinated HPP operations. Increased water storage capacities. Potential for installing floating solar on reservoirs. **Agriculture:** Increased water storage capacities.	**Environment:** Potential for highly negative impacts on ecosystems without proper siting and full Environmental Impact Assessment. Hydropower development should take into account the expected impacts of climate change. **Agriculture:** Potential conflicts from land captured in the reservoirs and water allocation issues
Increase security and affordability of energy supply / Promote renewable energy sources and energy efficiency.	**Water resources management:** Increasing non-hydro RES will reduce the need for additional HPPs and related stresses. **Water supply and sanitation:** Increased energy efficiency improves utilities' financial sustainability. **Agriculture:** On-site renewable energy installations (e.g., agro-photovoltaics). Increased energy efficiency reduces costs for farmers. **Environment:** Efficient heating reduces the need for wood fuels and unsustainable logging.	**Agriculture:** Solar installations on farmlands and/or switching to biofuels will reduce the available agricultural land for food production. Potential additional stress on available water in case of biofuel cultivation. **Environment:** Potential for highly negative impacts on ecosystems from harmful siting of wind farms in natural areas and/or unsustainable biomass use.

Environment and Biodiversity

Policy Objectives	Synergies	Trade-offs
Sufficient water for ecosystem services	**Water resources management:** Changes in rules around water allocation and permitting may be required.	**Energy:** Need to ensure appropriate regulations on environmental flows for HPP operations. **Agriculture:** Potential conflicts in case of scarce resources.
Expansion of system of protected areas.		**Agriculture:** Potential conflicts in land use. **Energy:** Potential impact on siting of RES installations.
Improvement of the SEA / EIA process.	**Water supply and sanitation:** Reduced potential impacts from WWS installations. **Agriculture:** Improved sustainability of agricultural production.	**Energy:** Potential impact on siting of RES installations.

The interface of hydropower operations and flood management

The challenge

- The absence of proper and strong regulation of Hydropower Plants (HPPs) and related water flows could potentially aggravate the problem of floods.
- No proper coordination and collaboration between KESH and IGJEUM in addressing flood protection.
- The “Regulation on discharge of water plots in Drin-river HPPs” that enables the operation of three HPP along Drini river is old and not updated.
- It does not envisage or requires KESH to have any data on short-term weather forecast.

Synergy

- Increase of the buffer zone in the reservoir during wet zone might significantly impact on flood control and reduction of damages in the downstream.

Increasing water and energy efficiency in irrigation and drainage

The challenge

- Drainage pumps are outdated and require high energy consumption.
- The irrigation infrastructure is old and there are high water losses in distribution.

Suggested options

- A new role for local Water Users Organisations (WUOs), in decision-making and possibly also in managing secondary canals
- Action plans and feasibility studies for improving the type of irrigation (focusing on drip irrigation) that would reduce water consumption.
- Capturing energy synergies through, for example, replacement of inefficient pumps, the installation of floating solar panels in irrigation reservoirs, agro-photovoltaics.

Nature-based solutions to address erosion affecting agriculture and dams

The challenge

Deforestation and human interventions have exacerbated the problem of erosion, resulting in sedimentation in dams (irrigation and HPP) and reducing their available capacity, while also reducing available agricultural lands.

Suggested options

Low-cost and multifunctional Nature-based solutions (NbS) can be used as innovative measures with a positive impact on soil quality, erosion processes, generation and transport of sediment, floodwaters and storm waters, while delivering parallel benefits in biodiversity, human health, rural development and employment.