

# Syr Darya River Basin NEXUS



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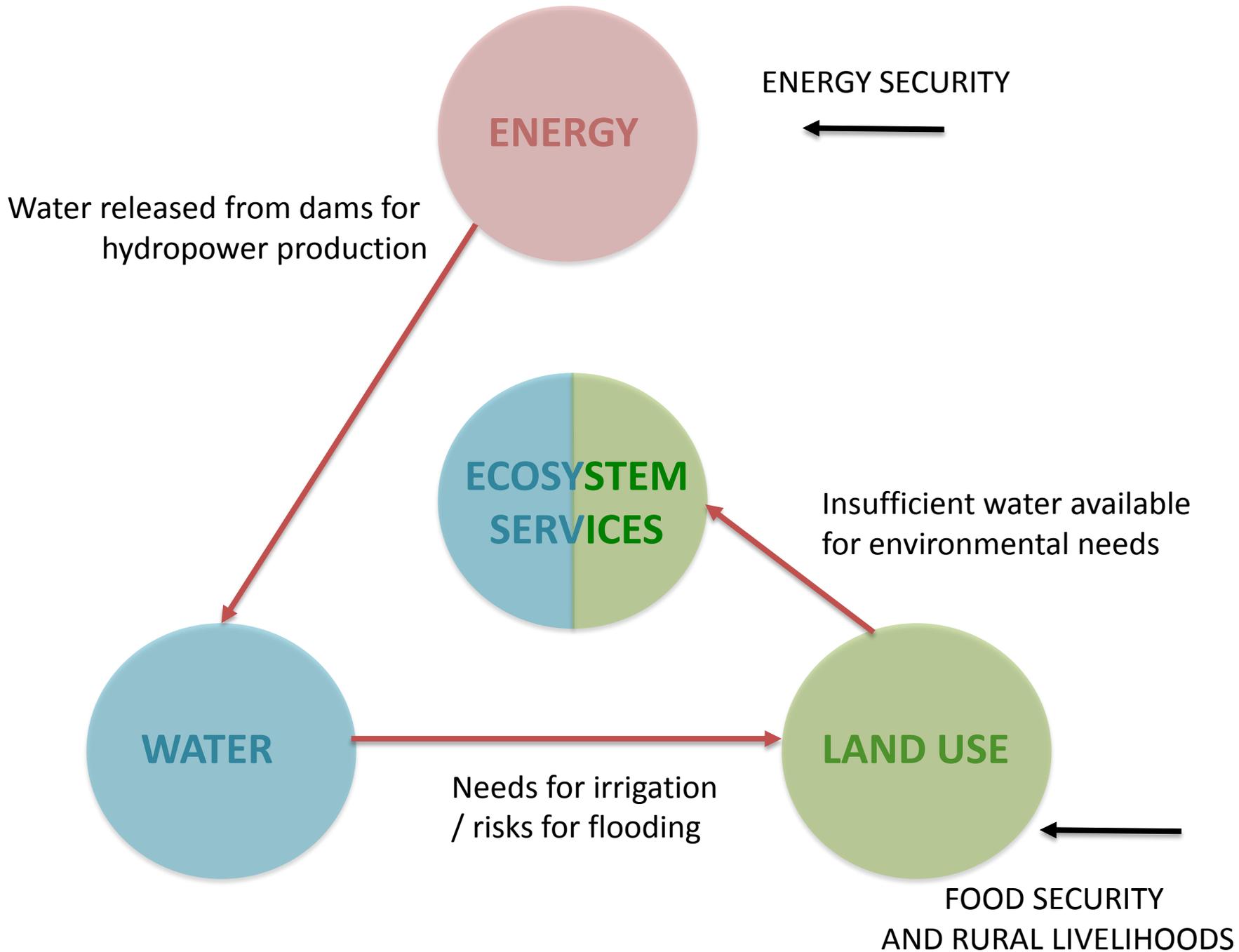
# Two big issues evolving around:

- **Water quantity**

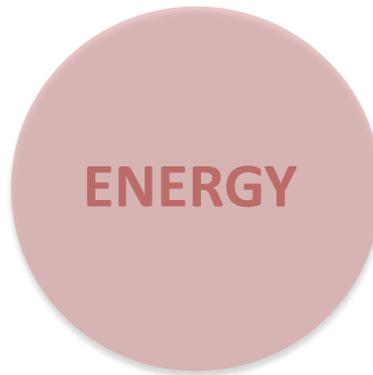
availability, seasonal needs of different sectors, environmental needs

- **Water quality**

most sectors using water and land resources contribute to pollution and need clean water



REDUCES PRESSURE  
ON HYDROPOWER  
IMPORTS TO COVER  
PEAK DEMANDS  
(BALANCE OF SUPPLY)



- Diversify energy sources
- Improve energy efficiency / optimize demand
- Develop energy trade

MORE WATER AVAILABLE  
FOR OTHER USES



MORE WATER TIMELY AVAILABLE  
FOR ENVIRONMENTAL NEEDS

HIGHER PRODUCTION  
PER UNIT OF WATER



- Water efficiency measures (economic instruments)
- Reduced water losses

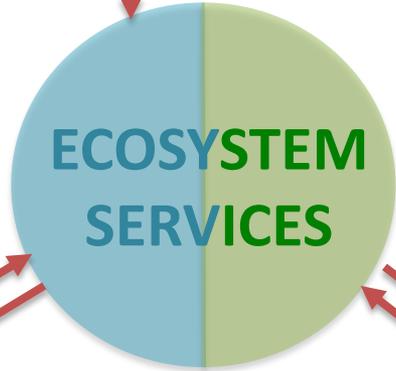


- Water reuse
- Water efficiency in agriculture

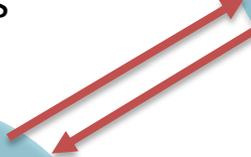
UNSUSTAINABLE PRACTICES  
IN INDUSTRY/MINING



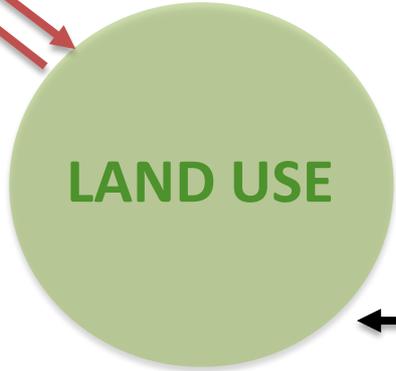
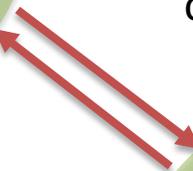
Negative impact on soil/water



Negative impact on  
ecosystems and  
downstream uses



Negative impact on  
soil/water quality  
and negative feedback  
on agricultural land



LACK OF WASTEWATER TREATMENT



UNSUSTAINABLE PRACTICES  
IN AGRICULTURE

BETTER SOIL AND WATER QUALITY

**INDUSTRY/  
MINING**



- Improve environmental management in industry/mining

BETTER QUALITY FOR ECOSYSTEMS  
AND USES DOWNSTREAM

**ECOSYSTEM  
SERVICES**

HEALTHIER ECOSYSTEMS

LESS SALINIZATION  
LESS MINERALIZATION



**WATER**

- Improve wastewater treatment



**LAND USE**

- Improve drainage and irrigation

# Trends – Climate Change

## Central Asia:

- Annual temperatures increase by 2°C by 2050. Annual runoff decrease by 12% and water scarcity aggravated in some areas. Annual precipitation intensity will increase (but not all models agree on mean annual precipitation) (WB & GFDRR, 2009).
- **Drought, avalanches, and landslides** will become more frequent and significant, as well as heat waves and drought, which will affect crop production. **Glacier melting and expansion of desert areas** will also progress (WB & GFDRR, 2009) (ZOI, 2009).

Food and energy insecurity, loss of fertile soil, loss of hydro production in dry years are already felt in the basin.

Extensive use of water for irrigation and large water losses will **aggravate water scarcity** in water scarce areas with impact on water supply to settlements and fields, in particular downstream. Continued high reliance on hydropower will mean that **electricity supply** will keep on being compromised in dry years.

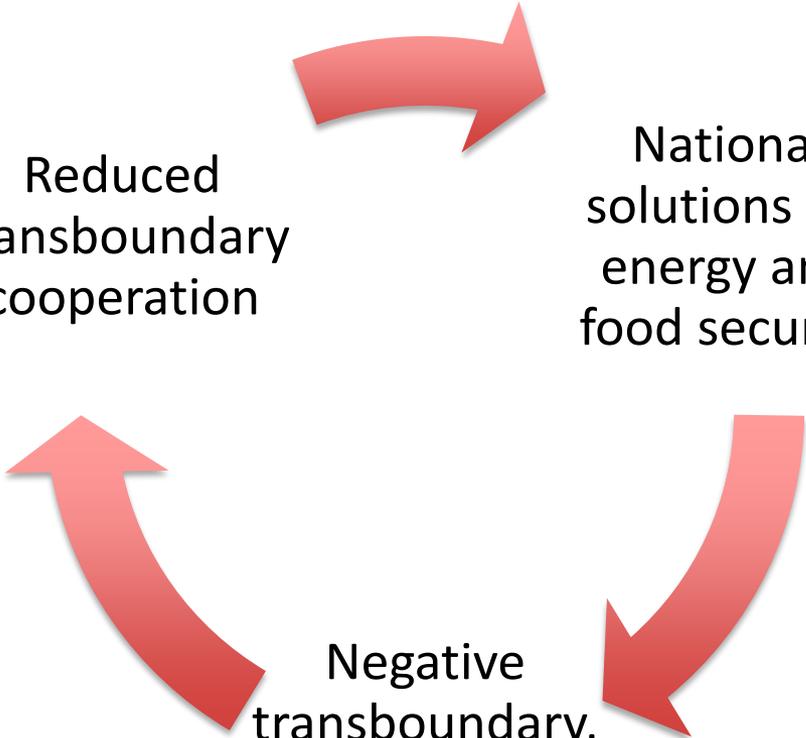
# Trends – Society and Economy

- Population growth / increased living standards and expansion of irrigated areas: Higher demands of water (including groundwater) and energy – higher impact on water availability and quality downstream
- Challenges of poverty and rural livelihoods more pressing
- More hydropower? More renewables?
- Less or more trade (in particular energy and food)?
- Diversification of crops?
- Restoration of fishery?
- Increased or decreased cooperation?

Reduced  
transboundary  
cooperation

National  
solutions for  
energy and  
food security

Negative  
transboundary,  
inter-sectoral  
effects



# Solutions that focus on national development with unintended co-benefits

1. Improving energy efficiency and reducing dependency on water for energy production.
2. Rationalizing water use (in particular in the agricultural sector)

Note that these require the following **enabling actions**:

- ✓ Building national planning capacity and strength of implementing institutions
- ✓ Developing sound data, metering and monitoring capacity
- ✓ Instituting efficient and appropriate cost recovery measures, while allowing support for pro-poor tariffs
- ✓ Providing incentives for improved end-user efficiency
- ✓ Providing an enabling and investor environment for domestic and international investment

# Solutions that focus on broader sustainable development and national policy coherence

3. Reinforcing environmental legislation and integrating environmental considerations into sectoral policies and management practices
4. Increasing policy coherence and coordination across sectors
5. Climate-proofing national development

Note that these require the following **enabling actions**:

- ✓ Developing integrated modeling capacity
- ✓ Extending and strengthening inter-sector integrated planning
- ✓ Establishing pathways to low water intensity development
- ✓ Applying risk management techniques
- ✓ Facilitating buffer water flows during 'non-dry' years

# Solutions that accelerate national development by furthering cooperation

6. Improving communication, information and knowledge sharing as well as joint monitoring
7. Facilitating trade for energy and agricultural products among the Syr Darya riparian countries
8. Dynamic allocation and solutions to the trans-boundary cross-sector nexus

Note that these require the **following enabling actions**:

- ✓ Investment in refurbishment and extension of national, regional and inter-regional transmission and energy transport systems
- ✓ Development of a fluid market with clear price signals
- ✓ Providing an enabling environment to support end users changing cropping and technology patterns
- ✓ Assessment of the value of the service that water provides to establish incentives for hydro re-scheduling
- ✓ Clear costing of energy and water security options for each country