Payment for Ecosystem Services in Upper Hrazdan Pilot River Basin of Armenia

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Selection of Pilot River Basin

- Area: 780 km²;
- Average altitude: 2170 m;
- Landscapes: steppes, forest, sub-alpine, alpine;
- Population: 102,000;
- Industry: mining, cement, thermal power station;
- Water uses: industrial, drinking, energy, irrigation, recreation;
- Inter-basin water transfer;
- Protected areas;
- Monitoring data;
Characterization of the Environment

- **Climate**
  - T - 5.5°C
  - P – 725 mm

- **Landscapes,**
  - Mountainous steppes: 67%,
  - Forest cover: 13%

- **Economy**
  - Large industries,
  - Livestock breeding & crop production agriculture

- **Natural disasters**
  - Mudflows, landslides
Characterization of the Environment

- Hydrology
  - Morphological characteristics of major rivers and tributaries,
  - Flow regimes recorded in hydrological posts,
- Reservoirs
- Water quality
  - Hrazdan, Marmarik and Tsaraghbyur Rivers - 1986-2010

![Graph showing flow regimes](image1)

![Graph showing suspended solids](image2)
Analysis of Use of Natural Resources

- Landscapes
  - degradation, energy crisis of 1990s
- Water supply and water use
  - deteriorated infrastructure, water loss, deficiencies in management
- Land resources
  - overgrazing
Diagnostic Analysis

- Problems identified
  - Water quality
  - Water quantity
  - Erosion
  - Deforestation
  - Land degradation

- Analysis of Legal Framework
  - Water Code
  - National Water Policy, National Water Programs
  - Other codes and laws (land, underground, forest, nature use)
  - Payment and rates of environmental fees and natural resources use fees
## Proposed PES Scheme

<table>
<thead>
<tr>
<th>Water-related ES</th>
<th>Description</th>
<th>Buyer</th>
<th>Seller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved water quality, and improved water habitat and fauna</td>
<td>Tourism accounting for some 2000 persons pays for the reconstruction of a wastewater treatment facility for 3800 persons (tourists and local population)</td>
<td>Tourism sector, represented by resort houses and hotels</td>
<td>Local community through giving the right of activities, which crease additional pressure on water quality</td>
</tr>
</tbody>
</table>
Proposed PES Scheme

- Improved ecosystem
- Tourism sector 2000 PE
- Local population 1800 PE
- Special Fund
- WWTP

2000 PE + 1800 PE
Next Steps

- Proposed law “On Payment for Ecosystem Services”
  - Subject of regulation,
  - Main concepts,
  - Types of PES schemes,
  - Rates for PES,
  - Procedures for calculation of fees and making payments,
  - Rights and obligations,
  - Control over the process
Other Activities in Armenia

- OECD component of the UNPD in Armenia
  - Review if and how economic instruments are being used in the Debed river basin and in the water management plan
  - Explore ways to strengthen their use to manage the demand for water, promote low costs options, and raise additional revenues for water policies in the basin
- USAID Clean Water and Energy Program in Armenia (2011-2014)
- UNDP/GEF “Reducing Transboundary Degradation of the Kura-Aras River Basin” (2011-2014)