

# Economic instruments for « better » water management and allocation

Food for thoughts from ... Armenia & elsewhere

*EU WI - Eastern Europe, Caucasus and Central Asia  
Bucharest, November 7 & 8, 2011*

# A « four step » presentation

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- **Step 1 - Economic instruments for water management in Armenia: current state of play**
- **Step 2 - Moving forward: investigating alternative economic instruments for water management in Armenia**
- **Step 3 - Widening the scope: what can research offer as « source of inspiration »?**
  - **IWRM.Net: CAP& Trade**
  - **7th EU FP: EPI-Water**
- **Step 4 – In conclusion**



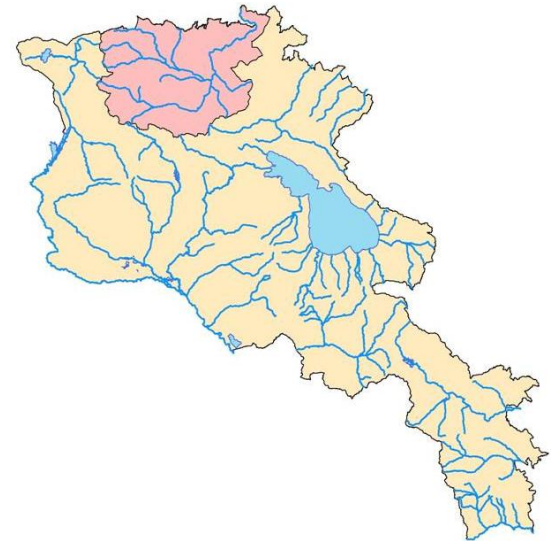
# Step 1 - Economic instruments for water management in Armenia (Debed river basin) :

## current state of play

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# The context

- **OECD initiative focusing on water management & economic instruments in the Debed River basin**
- **Main water uses: hydropower, irrigation, industry, fisheries, households**
- **Main organisations involved in water management**
  - **Water Resources Management Agency & the Northern Basin Management Organization of the Ministry of Nature Protection**
  - **Two water & sewage companies (and self-supplied local communities)**
  - **Water user associations and “irrigation intake” company**



# Current economic instruments

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- **Tariffs for water services**
  - Drinking water
  - Sewage
  - Irrigation (raw water, irrigation service)
- **Water resource fee**
  - Abstraction charge
  - Pollution charge

# Current level of tariffs for water services

Company	Service	Tariff
<b>LWSC</b>	Water supply	146.62 AMD/m <sup>3</sup>
	Wastewater discharge	34.36 AMD/m <sup>3</sup>
	Total	180.98 AMD/m <sup>3</sup>
<b>AWSC</b>	for each cubic meter of potable water supplied to consumers	154.47 AMD/m <sup>3</sup>
	for wastewater services for each cubic meter of supplied potable water	25.31 AMD/m <sup>3</sup>
	bulk service water	Raw water sold by the "Debed-Aghstev" irrigation water intake company to WAU at 36.47 AMD/m <sup>3</sup> and 2.07 AMD/m <sup>3</sup> (pumped water and gravity water, respectively)

Water sold to WUA at 11 AMD/m<sup>3</sup>

# Current levels of water resource taxes

Water resource	Purpose of use (AMD/m <sup>3</sup> )				Irrigation	Other	AMD per ton
	Fish production	Industrial	Drinking and domestic	Substance			
Surface water	0.025	0.5	0.5	1. Solid substances		5,300	
Fresh groundwater suitable for drinking purposes	0.05	1.0	1.0	1. Nitrogen ammonium		5,100	
				1. Acetone		301,000	
				1. BOD		18,400	
				1. Oil products		204,600	
				1. Copper		1,023,900	
				1. Sulphates		100	
<b>Activity Type</b>	<b>Total annual water abstraction, million m<sup>3</sup></b>	<b>Total annual fees in AMD</b>	<b>Share of total abstraction</b>	<b>Share of total fee</b>			
Drinking-household	20	30 587	0.01%	1%	1,023,000	30	
Fisheries	4106	699 698	0.31%	11%	153,400	40,000	
Industry	4563	4 269 142	0.34%	70%	511,500	18,200	
Technical	5213	1 101 887	0.39%	18%	16,900	16,900	
Irrigation	101 695	0	7.58%	0%	102,300	511,500	
Electricity generation	1 226 211	0	91.39%	0%	511,500	1,023,900	

# How do current economic instruments perform? (1)

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- **Question 1 - Are these instruments coherent with the “polluter pays principle” or “user pays principle”?**
  - Volumetric tariffs => higher the use, higher the bill
  - Unequal « share of the burden » between water abstractors
- **Question 2 - Do the revenues collected from these instruments cover costs?**
  - O&M costs only (partially) covered – 23% to 79% of O&M cost-recovery in irrigation, 76% for AWSC
  - No recovery of investment costs
  - Water abstraction covering a (very) marginal part of environmental costs?



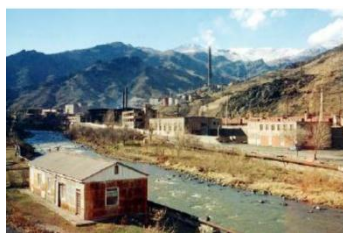
# How do current economic instruments perform? (2)

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- **Question 3 - Do existing economic instruments provide an incentive for more efficient use (allocation) of water resources?**
  - Volumetric charges as a « positive » element
  - However, household charge levels too low for incentiveness?
  - Incentiveness for wheat (as water bill represents 7% of total production costs)
  - No incentiveness of the water resource tax (too low)
- **Question 4 - How affordable are the existing instruments for various water uses?**
  - Water bill between 0.9% and 2.1% of revenue – but affordability likely to be an issue for low income groups
  - Affordability might be a problem for wheat producers



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## Step 2 - Moving forward: strengthening the role of economic instruments in Armenia

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# Different options considered (1)

Name of the instrument	General description
<b>Extending the abstraction tax to the hydropower sector</b>	Widening the basis of the existing abstraction tax by including hydropower sector
<b>Direct investment of local communities/water companies into the modernization of irrigation systems</b>	Water supply companies investing in the modernization of irrigation systems and being able to use the volumes of water saved for their own purpose.
<b>Applying a tax on energy production from hydropower</b>	Energy consumers paying an additional bonus to electricity produced from hydropower so revenues are used to support investments in hydro-morphological improvements (restoration of river flows, direct changes in morphology, etc.).
<b>Increase in land tax for houses nearby valuable water bodies (e.g. )</b>	The land tax is increased according to the proximity of land to valuable water systems as house owners and inhabitants enjoy specific amenities in terms of landscape. It is applied to all inhabitants or only to holiday houses. The revenues are used to invest in treatment plants or general ecological improvements of the water bodies concerned.
<b>Allocation of the tourism tax to water protection</b>	Part of the tourism tax is used for supporting water improvements that benefit to tourism (e.g. treatment plants, protection of valuable ecosystems that are visited by tourists, bathing sites...)
<b>Entry fee to users of sites of natural water importance (natural parks, bathing sites, protected wetlands, etc. )</b>	The entry fee pays for the ecological restoration of these sites.

# Different options considered (2)

## **“Innovative Pollution” fund**

Polluters polluting above an authorized limit pay a fine (or higher pollution rate) that is sufficiently high. The revenues from the fines or higher rate is then put in a fund, existing polluters submitting proposals for pollution reduction which most cost-effective ones are selected for receiving subsidies and putting new treatment or new industrial processes in place.

## **Payments for ecosystem services (already partially covered above)**

1. Local communities paying farmers or forest land owners for improved land practices in upper parts of the catchment to stop erosion and enhance water infiltration
2. Downstream local communities paying farmers upstream to establish wetlands so the capacity of the river is increased and floods controlled. Can be organized at the catchment scale

## **Specific tax on the sale of a product (e.g. mobile phones, cigarette...) for supporting environmental protection**

Part of the revenue from income tax of producers is allocated directly to an environmental fund that is used for supporting water quality improvements in the Debed river basin or other river basins of Armenia

## **Adaptation in the existing structure and level of the water abstraction tax**

Proposing different water abstraction tax levels for industry and to households (higher rates for industry)

## **Adaptation in the existing structure and level of the pollution tax**

Proposing different adaptation of the rates and application of the tax (e.g. applying the tax to the permit level and not to the actual pollution, saving administrative costs)

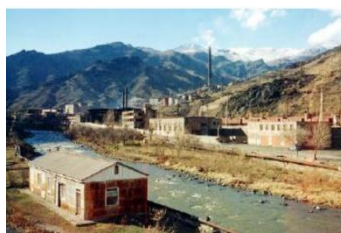
# Are these instruments « relevant »?

## Further assessments required

- A pre-requisite: specifying the design and implementation « in practice »
- What would be « appropriate » instruments? What are the costs for these instruments?
- Economic and social (budgetary) and social impacts? Who « loses »?
- Would « the environment » win? (under which conditions)
- Administrative issues (and costs)
- ....

**Work... just started!**

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## Step 3 - Widening the scope: what can research offer as « source of inspiration »?

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# Tradable permits (*water markets*) investigated in the CAP&Trade research project

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- Research focus on water management issues in three countries (Spain, Italy, France)
- Investigating different « tradable permit » or water market schemes (under a CAP)
  - Within (agriculture) or between (agriculture to municipalities) sectors
  - Temporary or permanent
  - Internal to, or inter-basins
  - Option markets
- Assessing economic and environmental impact, perception & acceptability, transaction costs...



# A wide range of economic instruments investigated in the EPI-Water research project (1)

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- Research performed by partners from Italy, Spain, Hungary, UK, Germany, Denmark, France
- Investigating a wide range of economic instruments for dealing with:
  - Scarcity
  - Excess water
  - Quality
  - Ecosystems and biodiversity
- *Ex-post* & *ex-ante* assessments looking at environmental impact, economic efficiency, transaction costs, acceptability, implementability....
- A first opportunity for sharing results: the first EPI-Water annual workshop, Berlin, January 2012



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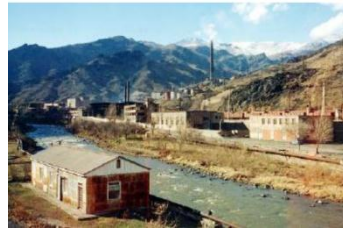


# A wide range of economic instruments investigated in the EPI-Water research project (2)

#	Name of EPI	Location	Type of Instrument	Sectors targeted	Pressures/ Water issues targeted
1	Voluntary water right transfers from agricultural uses to the urban sector	Tagus Basin, Spain	Tradable permit for abstraction	Urban and agricultural sectors	Water quality and abstractions
2	Payment for river regime restoration services	Lower Ebro Basin, Spain	Voluntary Agreement, Subsidies on practices	Hydropower generation	Hydro-morphology
3	Cooperative agreements between water supply companies and farmers in Dorset	The United Kingdom	Voluntary Agreements	Water supply companies, agriculture	Water quality (pollution)
4	Pesticide tax	Denmark	Water tariffs	Agriculture	Water quality (pollution)
9	Voluntary inter-sectoral water transfer	Llobregat Basin, Spain	Voluntary agreements	Agriculture, residential and industrial	Water quality (pollution)
10	Negotiation and monetary incentives to promote the use of reclaimed water	Tordera Basin, Spain	Subsidies on practices	Agriculture, residential and industrial	Water quality and abstractions
11	Groundwater tax	The Netherlands	Environmental tax	Agriculture, industry and environment	Management of groundwater tables
12	Volumetric pricing	The United Kingdom	Water tariffs	Urban water	Demand reduction
13	Abstraction Tax, subsidy and voluntary compensation agreements	Baden-Württemberg, Germany	Water tariffs	All water abstractors	Water quality and abstractions
18	Support to ecologically friendly hydropower plants through favourable electricity tariffs	Germany	Subsidies on products	Hydropower generation	Hydro-morphology
19	Financial compensation for environmental services	Evian, Haute Savoie, France	Voluntary agreements	Agriculture and urban	Water quality
20	Water pricing, Environmental taxes; Subsidies and incentives	Cyprus	Subsidies on practices	Domestic, agricultural and tourism	Water scarcity



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**Step 4 – In conclusion...**

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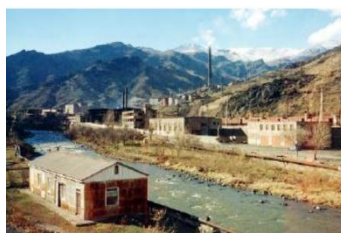
# A few words only....

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- **Economic instruments for water management in Armenia: the usual suspects...**
- **Their role: mainly recovery of O&M costs**
- **A wide range of alternative economic instruments that can be considered... but after careful assessment (e.g. social and economic impact) and « political justification »**
- **On-going EU research will bring some results that might be relevant for the region**
  - **IWRM.Net/CAP& Trade: [www.capandtrade.acteon-environment.eu](http://www.capandtrade.acteon-environment.eu)**
  - **7th EU FP/EPI-Water: <http://www.feem-project.net/epiwater/>**



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**Many thanks for your attention!**

For more information ....

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