Economic Dimension of Integrated Water Resources Management

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- Economic perspective on IWRM
- Value of water
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- Economic approaches and instruments
- Transboundary water resources management
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Economic Perspective on IWRM I

- Effects of water on the economy
  - Basic need
  - Input to economic activities
  - Environment
- Effects of water policies on the economy
  - Influence on the incentive structure of actors
  - Sectoral development (rate of growth)
  - Inter-sectoral allocation (structure)
  - Spatial allocation (regional distribution of growth)

Economic Perspective on IWRM II

- **Economics applied to IWRM:**
  - **Supports the selection of policy targets**
  - **Helps to assess the economic implications of different water policies (at different levels)**
  - **Assists in the choice of the optimal water resources management strategy**
  - **Supports the achievement of policy objectives by providing implementation tools & instruments**

Value of Water I

1. Water as an economic good

- **4th Dublin principle:** *"Water has an economic value in all its competing uses and should be recognized as an economic good"*
- **Production factor**
- **Key to economic development**

® **Related economic concepts:**

Example

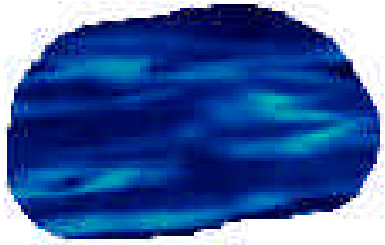
- **Opportunity costs: forgone value of alternative uses**
- **Externalities: actions of one user that affect the interests or wellbeing of another user („+" or „-")**

Value of Water - Example

- **Water has different values for different uses depending on their positions within the river system**
- **Two economic values can be distinguished here:**

1. **The value a user derives from a specific water use (WU) (eg irrigation) ® user value**
2. **The aggregate value that a unit of water can generate within the river system before it is consumed or lost through evaporation ® system value**

Value of Water - Example



WU_1

5% evaporation

Hydropower

8% evaporation

WU_2

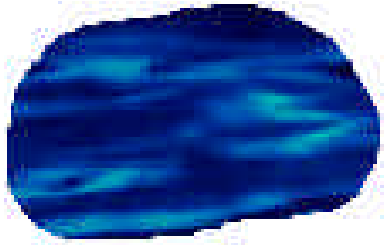
Benefits, revenues:

WU_1: \$ 0.05/m³

Hydropower: \$ 0.02/m³

WU_2: \$ 0.07/m³

Value of Water - Example



WU_1

5% evaporation

Scenario 1: Abstraction at WU_1
System value: (1-0.05) * $ 0.05
= $ 0.48/m³
User value: $ 0.05/m³

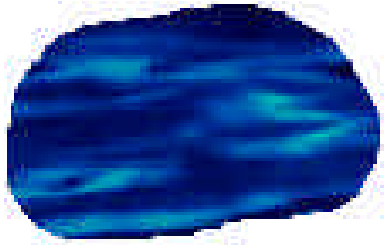
Hydropower

8% evaporation

WU_2

Benefits, revenues:
WU_1: $ 0.05/m³
Hydropower: $ 0.02/m³
WU_2: $ 0.07/m³

Value of Water - Example



WU_1

5% evaporation

Scenario 2: Abstraction at WU_2

System value: [(1-0.05) * $ 0.02]
+ [(1-0.05) * (1-0.08) * $ 0.07]
= $ 0.08/m³

User value: $ 0.02/m³ + $ 0.07/m³

Hydropower

8% evaporation

WU_2

Benefits, revenues:

WU_1: $ 0.05/m³
Hydropower: $ 0.02/m³
WU_2: $ 0.07/m³

Value of Water II

2. Water as an environmental good

- Nature as a user (water dependent eco-systems)
- Ecosystem services
  (eg flood protection, climate regulation)

3. Water as a social good

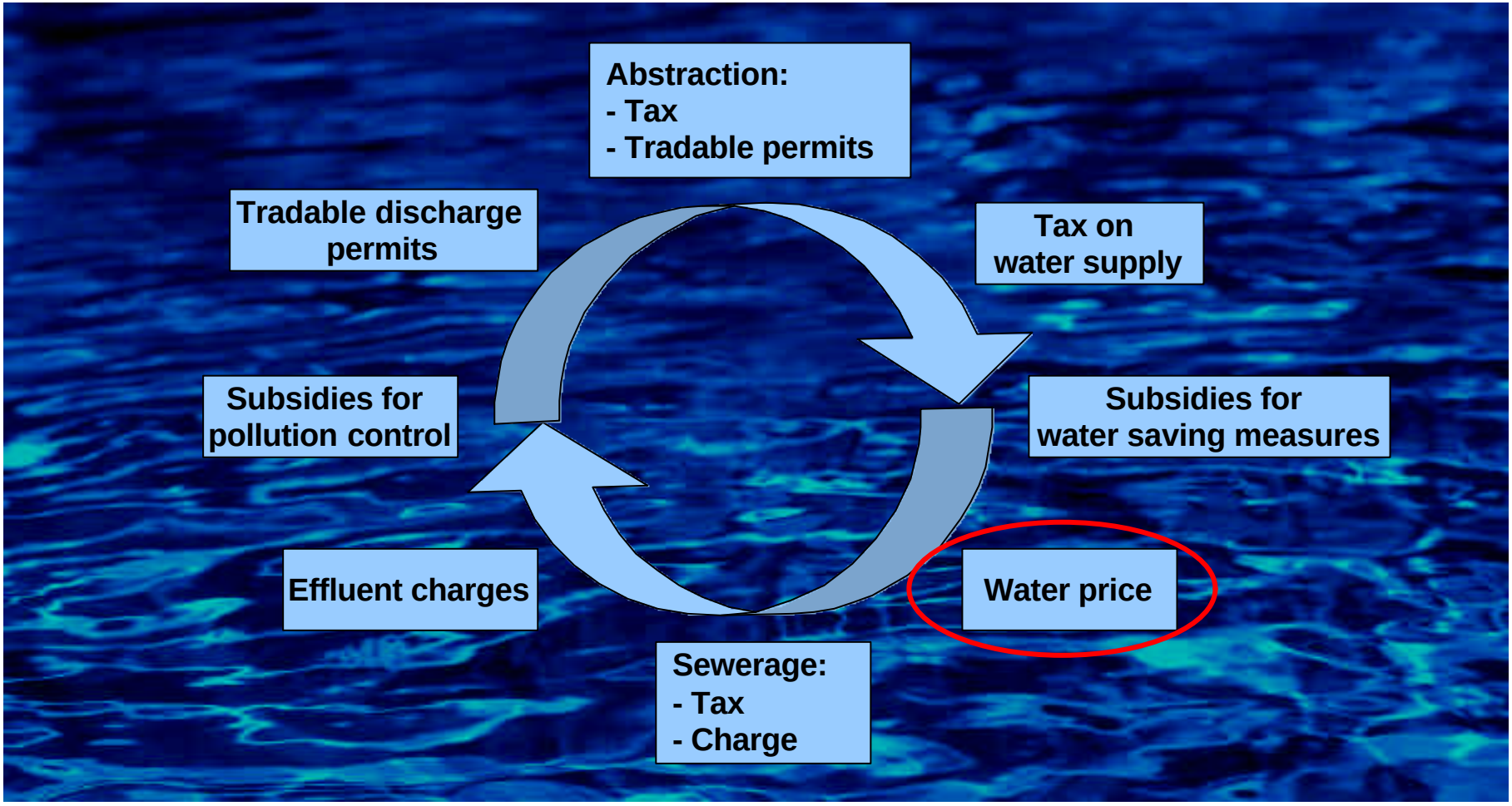
- Public health
- Gender
- Equity
- Culture and religion

Must also be considered in economic evaluation

Economic Approaches & Instruments I

- Economic instruments can be employed along the whole water cycle
- Functions of economic instruments:
  - Incentive function (internalisation of external costs)
  - Financial function (cost recovery)
  - Fiscal function (earmarking versus general taxation)
  - Soft function (information, capacity)

Economic Approaches & Instruments II



Water Pricing I

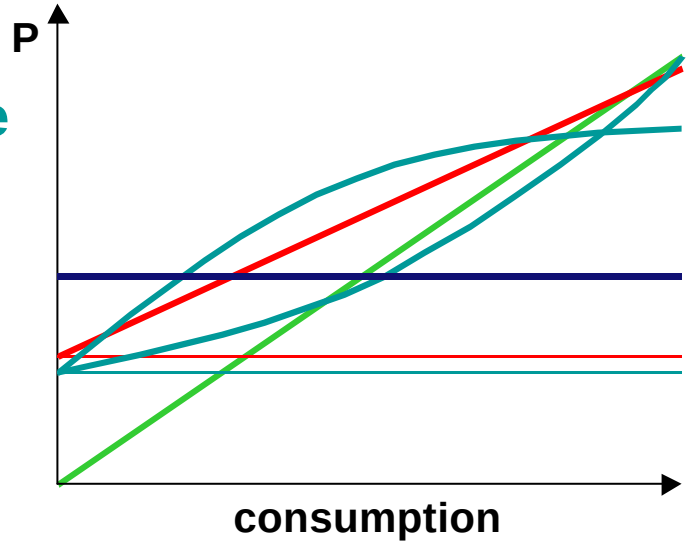
- **What makes pricing so important?**
  - **Reflects the value of water: sets incentives for efficient resource use & discourages overuse**
  - **(Financial) cost recovery of water services: generates revenue that allows to operate, maintain & extend services**
  - **Allocative efficiency: water „flows“ to highest value uses**

→ **Price structure must be in accordance with social (eg affordability) and environmental objectives**

Water Pricing II

Different methods of water pricing:

- Two-part tariffs with linear use rate
- Two-part tariffs with non-linear use rate
- Flat rate (not linked to use)
- Single linear tariff (linked to use)



- **Efficiency–equity trade-offs**
- **Pricing types may differ by sectors (eg agriculture) or users (eg vulnerable groups)**

Transboundary Water Resources Management I

- **Transboundary IWRM is complicated by:**
  - **Different legal frameworks**
  - **Uneven distribution of costs and benefits of water policies (upstream - downstream)**
  - **Differences in problem perception**
  - **Differences in preferences & policy dynamics**
- **European example of transboundary IWRM: EC Water Framework Directive (2000)**

Transboundary Water Resources Management II

- **Transboundary IWRM:**
  - **Can facilitate regional co-operation**
  - **Leads to better results: holistic view on water management (integrative problem perception)**
  - **Must be perceived as a „win-win“ situation by all involved actors to ensure co-operation**
  - **May involve the redistribution of benefits (through eg direct payments or ownership arrangements)**

Conclusion

- **Water and WRM policies impact through different channels on the economy**
- **Economics can support the formulation and implementation of WRM policies**
- **Economic analyses always need to take other objectives (social, environmental) into account**
- **Increasing water scarcity ® economic & equity considerations will increase further in importance**

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