



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W KRAKOWIE



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W GLIWICACH

*Twinning Covenant PL 2003/IB/EN/02*

*Continuation of the Implementation of the European Water Framework Directive*

***THE ECONOMIC DATA BASE –  
AN INSTRUMENT SUPPORTING  
PREPARATION OF THE  
PROGRAMMES OF MEASURES IN  
ACCORDANCE TO THE WATER  
FRAMEWORK DIRECTIVE***

*J.Grela, A.Hobot – Wojna, M.Owsiany, K.Szewczyk  
Poland*

***RIOB – MEGEVE  
SEPTEMBER 2006***



## Scope of programme of measures

**According to the Art. 11 and the Appendix VI of the Water Framework Directive, the programme of measures is a list of actions (legal, financial, tax, investment,...) allowing the achievement of the good status. This list includes:**

- ◆ **Basic measures – resulting from the national and Community legislation,**  
**and if these actions are not sufficient to achieve the good water status,**
- ◆ **Supplementary measures – specific actions undertaken on the river basin level.**



## Selection of potential measures

### Sources:

- **Selection of Potential Measures [IMGW Kraków, 2005] with consideration of specified basic and supplementary measures.**
- **French elaboration – *Thesaurus* and German version of manual concerning minimum cost effectiveness.**
- **Programmes of Environmental Protection for voivodships, and poviats and selected communities within the territory of the “Upper-Vistula” pilot basin, considering proposed future measures to improve the status of the aquatic environment**
- **feasibility studies for voivodship, poviat and commune investments**
- **good practices (agriculture, BAT industry etc.)**
- **selected executive and post-executive cost estimates for implemented investments**
- **trade offers of entities from the field of environmental condition improvement**



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W KRAKOWIE

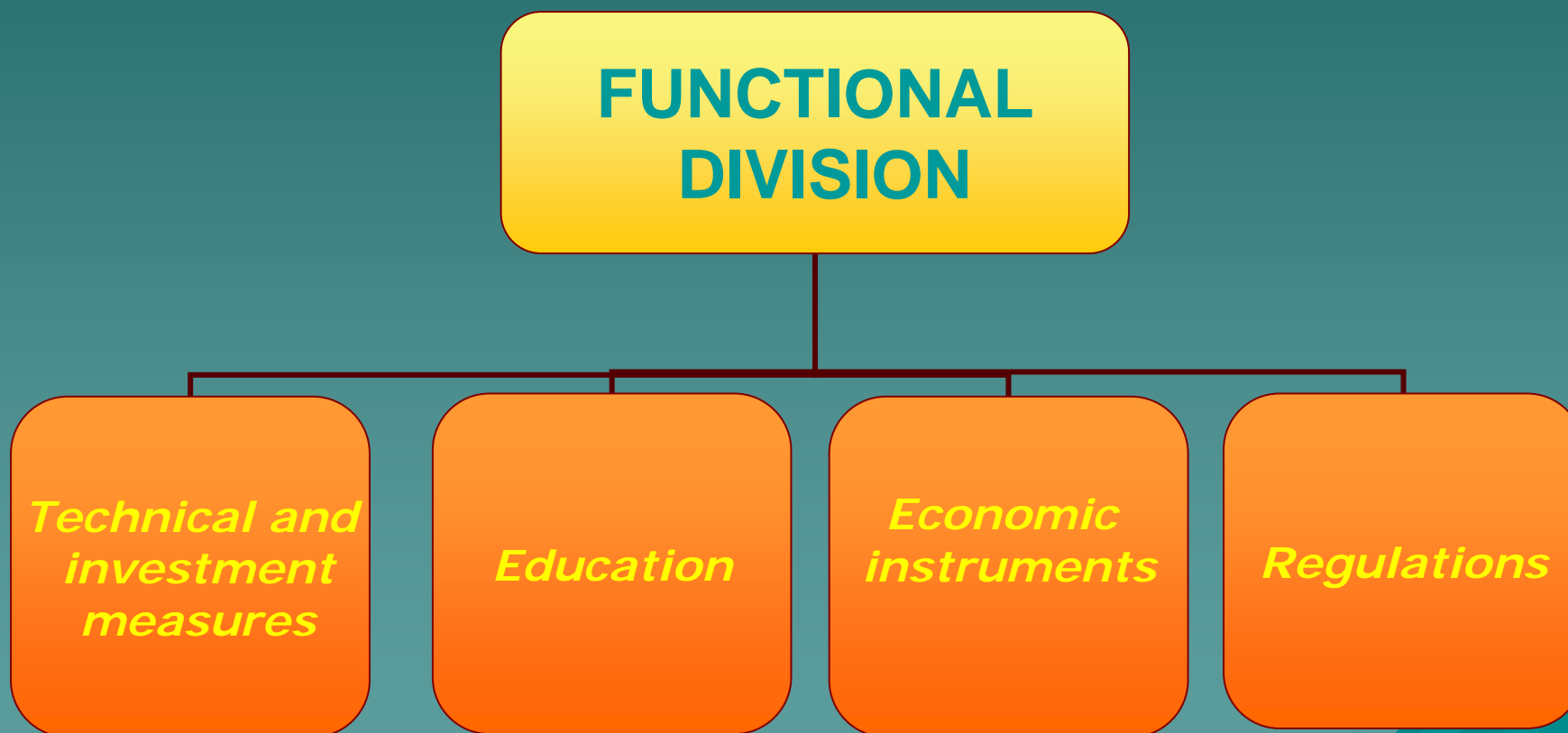


REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W GLIWICACH

*Twinning Covenant PL 2003/IB/EN/02*

*Continuation of the Implementation of the European Water Framework Directive*

## Division of measures





REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W KRAKOWIE

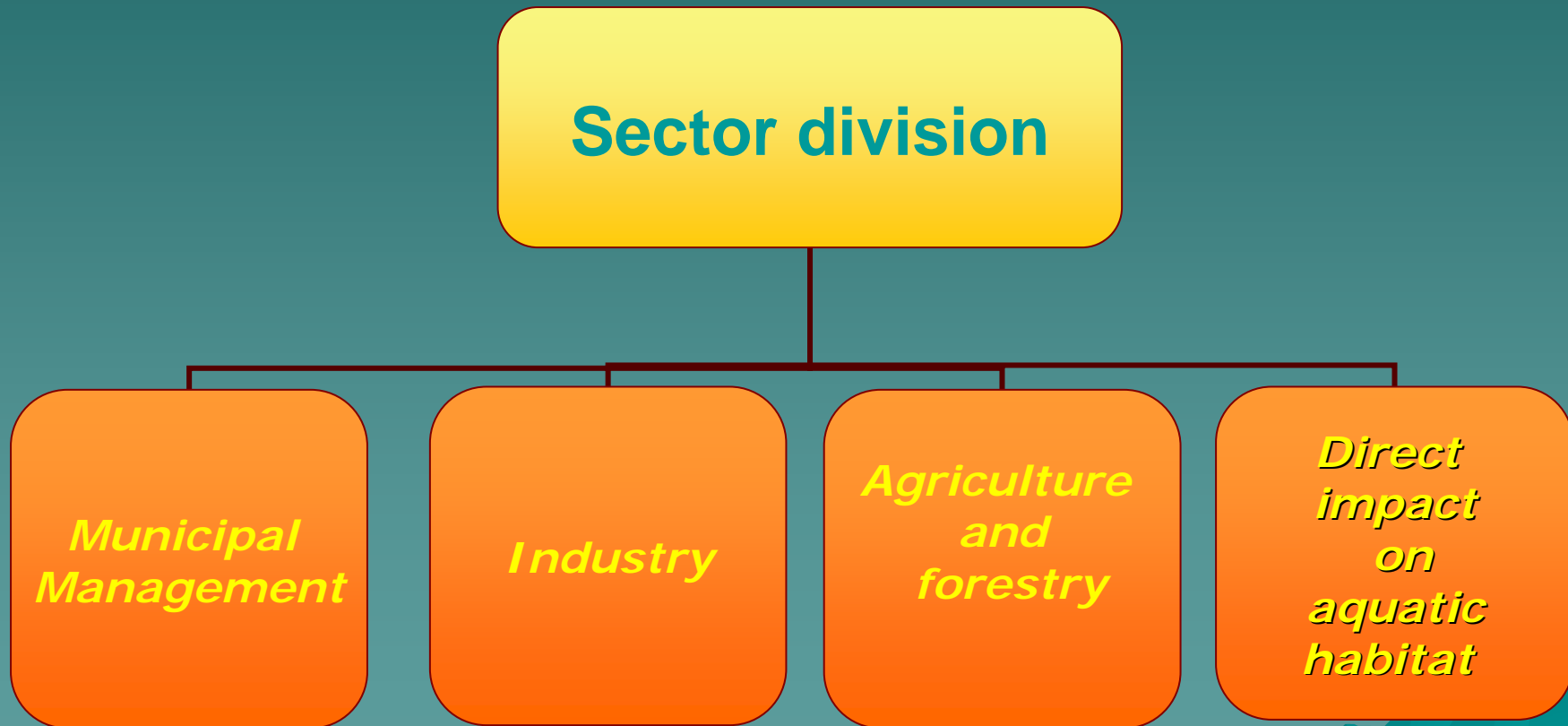


REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W GLIWICACH

*Twinning Covenant PL 2003/IB/EN/02*

*Continuation of the Implementation of the European Water Framework Directive*

## Division of measures





## **Municipal management – scope of measures**

- ◆ **Sewage collection and treatment:**
  - building, development, and modernization of sewage system (combined sewage system, storm sewage system,
  - building or development of municipal sewage – treatment plant,
  - modernization of sewage treatment technology in existing sewage treatment plants,
  - sludge (waste sediment) management,
  - building of sewage treatment plants adjoining to the house,
  - building of leak proof sewage containers with reassurance of controlled sewage disposal
- ◆ **Water supply**
  - building of surface water and groundwater intakes,
  - building or modernization of water supply system,
  - protection areas of surface water intakes,
  - protection areas of groundwater intakes,
  - wastes management
  - protection of municipal wastes storage yards
- ◆ **Transport**
  - rain (storm) waters treatment tanks,
- ◆ **Ecological education**
  - encouraging inhabitants not to use household chemical agents containing phosphates,
  - encouraging inhabitants to economic use of water,
  - encouraging inhabitants (on the areas without sewage system) to build sewage treatment plants adjoining to the house,



## Industry - scope of measures

- ◆ **Sewage collection and treatment:**
  - building of industry waste treatment plants,
  - sludge (waste sediment) management,
  - initial treatment of industry wastes,
  - use of settlers (sediment tanks) and separators of rain waters from the industry areas,
- ◆ **Water supply**
  - building of surface water intakes,
  - building of groundwater intakes,
  - cooling of the industrial waters in the open cycles
- ◆ **Wastes management**
  - protection of industrial wastes storage yards
- ◆ **Revitalization of degraded areas**
  - post industrial areas reclamation,
  - post military areas reclamation,
- ◆ **Ecological education**
  - introduction of BAT technology in the range of waste management into industry,
  - encouraging the industrial sector to limit production of agents containing phosphates,
  - encouraging the industrial sector to use the rational water management



## **Agriculture and forestry - scope of measures**

- ◆ **Animal farming**
  - collection of manure, liquid manure, and dung in the proper conditions,
- ◆ **Plant growing**
  - counteraction to erosion ,
  - soil examination aiming in selection of proper fertilization level,
  - a proper level of fertilization,
  - selection of the use and type of cultivation,
  - creation of buffer areas,
  - changes of the arable land use,
  - changes of the irrigation technology,
- ◆ **Forestry**
  - Increase of the forests woodiness,
- ◆ **Fishery**
  - Economical (rational) water management in fishery,
- ◆ **Increase of the ecological awareness**
  - encouraging the farmers to use the Good Agriculture Practices,
  - encouraging the farmers to rational water management (irrigation, ponds).





REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W KRAKOWIE



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W GLIWICACH

*Twinning Covenant PL 2003/IB/EN/02*

*Continuation of the Implementation of the European Water Framework Directive*

## Direct impact on aquatic habitat – scope of measures

- ◆ **Shaping of the favorable conditions for the aquatic habitats**
  - **demolition of parts of hydro technical objects to protect fish migration,**
  - **building of the fish passes allowing fish migration,**
  - **protection of the natural habitats depending on water,**
- ◆ **Shaping of the natural and artificial retention**
  - **recreation of the natural flood areas on the areas of the dispersed development,**
  - **decreasing of erosion in the coastal areas,**
  - **creation of wetlands in the coastal areas of the reservoirs,**
  - **limitation of the embankments length on the agriculture areas,**
  - **use of the old river beds and initiation of the meanders for the development of the flood areas,**
- ◆ **Shaping of the hydro-morphological conditions of streams and rivers**
  - **building of embankment,**
  - **shaping of streams and river beds and banks,**
  - **liquidation of flood damages,**
  - **building, modernization, or demolition of the hydro technical object,**
  - **water management on the retention reservoirs.**



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W KRAKOWIE



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W GLIWICACH

*Twinning Covenant PL 2003/IB/EN/02*

*Continuation of the Implementation of the European Water Framework Directive*

## The Economic Data Base

### Purpose:

**development of the information system about the potential costs of the measures in the pilot area**

**support in calculation of the general costs of the pilot programme of measures**

**instrument of economic analysis for heavily modified water bodies and for eventual justification of derogation**

**support for the development of the programmes of measures for other water regions**



# The Economic Data Base

**PART I**



**MUNICIPAL MANAGEMENT**

**PART II**

**INDUSTRY**

**PART III**

**AGRICULTURE AND FORESTRY**

**PART IV**

**DIRECT IMPACT ON AQUATIC HABITAT**

Sector	Subsector	Sector	Subsector	Operations	Category	Impact	1 cubic metre		
					IO - investment operations TO - technical operations EO - educational operations	a - amount q - quality m - morphology y b - biology	Qualitative Description	Physical Unit	
	2	1	1	2	3	4	5	6	7
Municipal management	Sewage collection and treatment	Agriculture and forestry	Direct impact on aquatic habitat	Shaping favourable conditions for existence of aquatic	Removal of protective elements and a proportion of hydrotechnic facilities to secure fish migration	IO	m b	Demolition of protection elements - net/stone baskets	1 cubic metre
						IO	m b	Demolition of protection elements - fascine	1 cubic metre
						IO	m b	Demolition of protection elements - wicker lace	1 square metre
						IO	m b	Demolition of protection elements - rock filling	1 cubic metre
						IO	m b	Demolition of hydrotechnic facilities	1 cubic metre



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W KRAKOWIE



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W GLIWICACH

## Twinning Covenant PL 2003/IB/EN/02

### Continuation of the Implementation of the European Water Framework Directive

# The Economic Data Base



## PART I MUNICIPAL MANAGEMENT

Sector	Subsector	Operations	Category	Impact	Fundamental Actions		Expected Impact/Effect	Scale of Reference: L - local, R - regional N - national	Investment / Undertaking Implementation Period	Time to achieve full operation effectiveness S - short-term – less than 5 years M - mid-term – 5-10 years L – long-term – more than 10 years
			IO - investment operations TO - technical operations EO - educational operations RO - regulatory operations FO - fiscal operations	a - amount q - quality m - morphology b - biology	Qualitative Description	Physical Unit				
1	2	3	4	5	6	7	8	9	10	11
Municipal management	Sewage Collection and Treatment	construction (expansion) of sanitary sewage system	IO	q a b	Construction of gravitational sewage system		Reduction of territorial pollution by increasing the proportion of households connected to the sewerage system	L	1 year	S
					In highly-urbanized areas	100 running metres				
					In poorly-urbanized areas	100 running metres				
					Construction of pressure sewerage		Reduction of territorial pollution by increasing the proportion of households connected to the sewerage system	L	1 year	S
					In highly-urbanized areas	100 running metres				
					In poorly-urbanized areas	100 running metres				

# The Economic Data Base



Amortization Time	Basic Depreciation Rate - according to KŚT	Investment/Undertaking Lifetime	Per-unit Financial Costs [PLN]						Possible Environmental Impact (other than water-)				
			Execution Expenses		Annual Operating Costs (amortization not included)		Annual Amortization Costs		Positive		Negative		
			min	max	min	max	min	max	Qualitative Description	Costs Estimate	Qualitative Description	Costs Estimate	
12	12	13	14	15	16	17	18	19	20	21	22	23	
30-40 years	10%	60 years								Reduction of Soil Pollution		In justified cases tree felling required	
30-40 years	10%	60 years	25 000	30 000	50	100	625	750					
60 years	10%	100 running metres	20 000	25 000	50	100	500	625					
30-40 years	10%	60 years								Reduction of soil pollution		In justified cases tree felling required	
30-40 years	10%	60 years	30 000	35 000	80	120	750	875					
30-40 years	10%	60 years	25 000	30 000	80	120	625	750					



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W KRAKOWIE



REGIONALNY  
ZARZĄD  
GOSPODARKI  
WODNEJ  
W GLIWICACH

## Twinning Covenant PL 2003/IB/EN/02

### Continuation of the Implementation of the European Water Framework Directive

Possible Socio-economic Impact				Units Responsible for the Implementation	Potential Financing Sources	Major Estimated Uncertainty Sources (cost, effect, etc.)	Action Effectiveness Assessment (1-5) 1 - highest effectiveness 5 - lowest effectiveness	Action Plausibility Assessment (1-5) 1 - highest plausibility 5 - lowest plausibility
Positive		Negative						
Qualitative Description	Costs Estimate	Qualitative Description	Costs Estimate					
24	25	26	27	28	29	30	31	32
Improvement of population's general health and acceleration of economic development including tourism		Increase in household maintenance costs		Community, intercommunal association	Community budgets, sewage system companies' resources, aid funds, NFOŚiGW, WFOŚiGW, residents' own funds	Administrative proceedings duration Possible acquisition of external funds for investment execution	1	1
Improvement of population's general health and acceleration of economic development including		Increase in household maintenance costs		Community, intercommunal association	Community budgets, sewage system companies' resources, aid funds, NFOŚiGW, WFOŚiGW, residents' own funds	Administrative proceedings duration Possible acquisition of external funds for investment execution	1	1



## Scope of necessary information

⇒ **Description of measures for elementary tasks:**

⇒ **Qualitative description**

⇒ **Physical unit**

⇒ **Expected impact/effect**

⇒ **Scale of reference – definition of operation's impact range:**

**L - local – commune, town area,**

**R – regional – voivodship, water region area,**

**N – national – entire country area**

⇒ **Investment / undertaking implementation period**

⇒ **Time to reach full operation effect according to:**

**S – short-term operations – less than 5 years**

**M – medium-term operations – 5-10 years**

**L – long-term operations – more than 10 years**



## Scope of necessary information

⇒ **Amortization time**

⇒ **Investment / undertaking lifetime**

⇒ **Per-unit financial costs [PLN]**

⇒ **Capital costs (min – max)**

⇒ **Annual operation costs (excl. amortization) (min - max)**

⇒ **Annual amortization costs (min – max)**

⇒ **Possible environmental impact**

⇒ **Positive (qualitative description, costs estimate)**

⇒ **Negative(qualitative description, costs estimate)**



## Scope of necessary information

- ⇒ Possible socio-economic consequences
  - ⇒ Positive (qualitative description, costs estimate)
  - ⇒ Negative (qualitative description, costs estimate)
- ⇒ Units responsible for implementation
- ⇒ Potential financing sources
- ⇒ Major estimated uncertainty sources (cost, effect, etc.)
- ⇒ Operation effectiveness assessment
- ⇒ Operation plausibility assessment