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
Twinning Covenant PL 2003/IB/EN/02
Continuation of the Implementation of the European Water Framework Directive

Division of measures

FUNCTIONAL DIVISION

- Technical and investment measures
- Education
- Economic instruments
- Regulations
Twinning Covenant PL 2003/IB/EN/02
Continuation of the Implementation of the European Water Framework Directive

Division of measures

Sector division

- Municipal Management
- Industry
- Agriculture and forestry
- Direct impact on aquatic habitat
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).
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.
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
**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

<table>
<thead>
<tr>
<th>Subsector</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewage collection and treatment</td>
<td>Direct impact on aquatic habitat</td>
</tr>
</tbody>
</table>

#### Subsector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Subsector</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal management</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PART II  INDUSTRY

#### Sector

<table>
<thead>
<tr>
<th>Subsector</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture and forestry</td>
<td>Direct impact on aquatic habitat</td>
</tr>
</tbody>
</table>

#### Subsector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Subsector</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PART III  AGRICULTURE AND FORESTRY

#### Sector

<table>
<thead>
<tr>
<th>Subsector</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture and forestry</td>
<td>Direct impact on aquatic habitat</td>
</tr>
</tbody>
</table>

#### Subsector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Subsector</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PART IV  DIRECT IMPACT ON AQUATIC HABITAT

#### Category

<table>
<thead>
<tr>
<th>IO - investment operations</th>
<th>TO - technical operations</th>
<th>EO - educational operations</th>
</tr>
</thead>
</table>

#### Impact

- a - amount
- q - quality
- m - morphology
- b - biology

#### Qualitative Description

**Removal of protective elements and a proportion of hydrotechnic facilities to secure fish migration**

<table>
<thead>
<tr>
<th>Category</th>
<th>Impact</th>
<th>Physica l Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO m b</td>
<td>Demolition of protection elements - net/stone baskets</td>
<td>1 cubic metre</td>
</tr>
<tr>
<td>IO m b</td>
<td>Demolition of protection elements - fascine</td>
<td>1 cubic metre</td>
</tr>
<tr>
<td>IO m b</td>
<td>Demolition of protection elements - wicker lace</td>
<td>1 square metre</td>
</tr>
<tr>
<td>IO m b</td>
<td>Demolition of protection elements - rock filling</td>
<td>1 cubic metre</td>
</tr>
<tr>
<td>IO m b</td>
<td>Demolition of hydrotechnic facilities</td>
<td>1 cubic metre</td>
</tr>
</tbody>
</table>
**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

<table>
<thead>
<tr>
<th>Sector</th>
<th>Subsector</th>
<th>Operations</th>
<th>Category</th>
<th>Impact</th>
<th>Fundamental Actions</th>
<th>Expected Impact/Effect</th>
<th>Scale of Reference: L - local, R - regional, N - national</th>
<th>Investment / Undertaking Implementation Period</th>
<th>Time to achieve full operation effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal</td>
<td>Sewage</td>
<td>Sewage collection and treatment</td>
<td>IO - investment operations</td>
<td>a - amount</td>
<td>Construction of gravitational sewage system</td>
<td>Reduction of territorial pollution by increasing the proportion of households connected to the sewerage system</td>
<td>L</td>
<td>1 year</td>
<td>S</td>
</tr>
<tr>
<td>management</td>
<td>Collection</td>
<td></td>
<td>TO - technical operations</td>
<td>q - quality</td>
<td>Reduction of territorial pollution by increasing the proportion of households connected to the sewerage system</td>
<td>L</td>
<td>1 year</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td></td>
<td>EO - educational operations</td>
<td>m - morphology</td>
<td>Reduction of territorial pollution by increasing the proportion of households connected to the sewerage system</td>
<td>L</td>
<td>1 year</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sewage construction (expansion)</td>
<td>RO - regulatory operations</td>
<td>b - biology</td>
<td>Reduction of territorial pollution by increasing the proportion of households connected to the sewerage system</td>
<td>L</td>
<td>1 year</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>of sanitary sewage system</td>
<td>FO - fiscal operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Construction of pressure sewerage | 100 running metres | 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 | Reduction of territorial pollution by increasing the proportion of households connected to the sewerage system | L | 1 year | S |
| In poorly-urbanized areas | 100 running metres | Reduction of territorial pollution by increasing the proportion of households connected to the sewerage system | L | 1 year | S |
### Twinning Covenant PL 2003/IB/EN/02
Continuation of the Implementation of the European Water Framework Directive

The Economic Data Base

<table>
<thead>
<tr>
<th>Amortization Time</th>
<th>Basic Depreciation Rate - according to KŚT</th>
<th>Investment/U Undertaking Lifetime</th>
<th>Execution Expenses (min, max)</th>
<th>Annual Operating Costs (amortization not included) (min, max)</th>
<th>Annual Amortization Costs (min, max)</th>
<th>Possible Environmental Impact (other than water-)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Qualitative Description</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40 years</td>
<td>10%</td>
<td>60 years</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40 years</td>
<td>10%</td>
<td>60 years</td>
<td>25 000</td>
<td>30 000</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 years</td>
<td>10%</td>
<td>100 running metres</td>
<td>20 000</td>
<td>25 000</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40 years</td>
<td>10%</td>
<td>60 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40 years</td>
<td>10%</td>
<td>60 years</td>
<td>30 000</td>
<td>35 000</td>
<td>80</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40 years</td>
<td>10%</td>
<td>60 years</td>
<td>25 000</td>
<td>30 000</td>
<td>80</td>
<td>120</td>
</tr>
</tbody>
</table>
### Possible Socio-economic Impact

<table>
<thead>
<tr>
<th>Positive</th>
<th>Negative</th>
<th>Units Responsible for the Implementation</th>
<th>Potential Financing Sources</th>
<th>Major Estimated Uncertainty Sources (cost, effect, etc.)</th>
<th>Action Effectiveness Assessment (1-5)</th>
<th>Action Plausibility Assessment (1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of population’s general health and acceleration of economic development including tourism</td>
<td>Increase in household maintenance costs</td>
<td>Community, intercommunal association</td>
<td>Community budgets, sewage system companies’ resources, aid funds, NFOŚiGW, WFOŚiGW, residents’ own funds</td>
<td>Administrative proceedings duration Possible acquisition of external funds for investment execution</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Improvement of population’s general health and acceleration of economic development including tourism</td>
<td>Increase in household maintenance costs</td>
<td>Community, intercommunal association</td>
<td>Community budgets, sewage system companies’ resources, aid funds, NFOŚiGW, WFOŚiGW, residents’ own funds</td>
<td>Administrative proceedings duration Possible acquisition of external funds for investment execution</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
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