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Implementation of the River Basin Management Plan – a Major Step in Sustainable Water Management

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Abstract:

River Basin Management Plan is the most important tool for the implementation of the Water Framework Directive 2000/60/EU.

The main goals are the achievement of the "good status" for water until 2015 in order to bring the same conditions of life from the water point of view for all the citizens.

RBMP has to fit into the Romanian National Management Plan, which will be included into Danube District Management Plan;

RBMP proposes measures which will lead to the achievement of the objectives concerning the sustainable utilization of the water resources.

Keywords: River Basin Management Plan, WFD 2000/60/EC, programs of measures, sustainable water management.

1. INTRODUCTION

At the level of the European Union and also at the la national level, due to the growing pressures on the water resources, there were imposed legal acts for the protection of water resources and sustainable water management in order to assure a good living standard:

- Directive 75/440 concerning the quality required of surface water intended for the abstraction of drinking water – transposed into the Romanian legislation by HG 100/2002, modified by HG 662/2005, HG 567/2006 completed by HG 210/2007;
- Directives 98/83/EC and 80/923/EEC on the quality of water intended for human consumption, transposed by Law 458/2002 and Law 311/2004;
- Directive 91/271/EC concerning urban waste-water treatment transposed by HG 188/2002 completed by HG 352/2005 and HG 210/2007;
- Water Framework Directive 2000/60/EC – transposed by Law 107/1996, Law 310/2004 and Law 112/2006.

Implementation of the requests of these directives will lead to a quality and quantity improvement of water resources and will increase the level of comfort of the population from the following points of view: access to adequate water supply systems, sewage and water treatment.

River Basin Management Plan represents the main tool for the implementation of the Water Framework Directive 2000/60/EU.

Development and implementation principles of the RBMP:

- interactive, transparent and open scheduling;
- development of interactive policies;
- engagement of all stakeholders;

Within the frames of RBMP there will be proposed measures in order to achievement of the objectives aiming sustainable water source utilization.

2. STEPS IN THE DEVELOPMENT OF THE RIVER BASIN MANAGEMENT PLAN OF THE BANAT HYDROGRAPHICAL AREA

2.1. Program of measures within the scheduling process ("Fig. 1"):

- is correlated with sustainable development strategies and policies;
- becomes operational simultaneously with the enforcement of the HG;
- was established on the basis of informing, consulting and participation of stakeholders;
- represents two categories of measures: basic and supplementary.

2.2. Scenarios ("Fig. 2") for the achievement of environmental objectives:

- Basic scenario – taking of measures for the implementation of the European Directives in the field of water quality
- Optimal scenario – BS + supplementary measures for the achievement of environmental objectives

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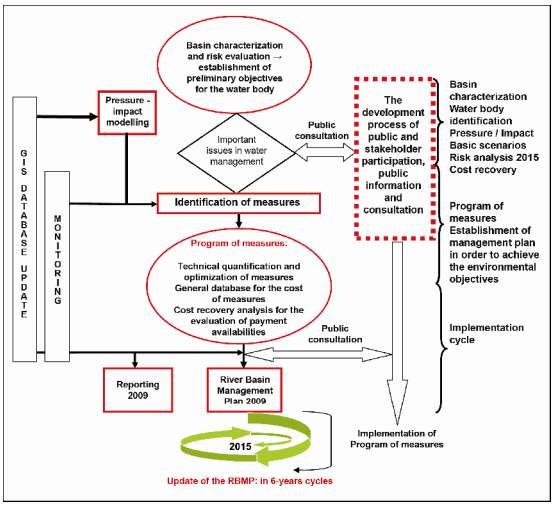
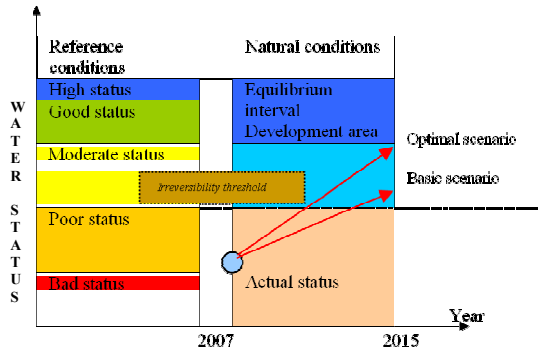
Fig. 1" The program of measures within the planning process



Basic scenario – measures for the implementation of the European Directives in the field of water quality
Optimal scenario – supplementary measures in addition to the basic measures for the achievement of good status / good ecological potential in 2015.

"Fig. 2" Scenarios for the achievement of environmental objectives



3. MEASURES FOR REDUCTION OF THE POLLUTION DUE TO HUMAN AGGLOMERATIONS

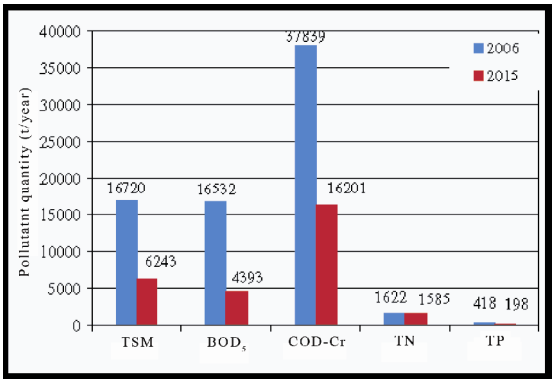
These measures are associated with the implementation of the requests of the European directives in this field:

- Directives 75/440/EEC, 98/83/EC, 79/869/EEC, 76/160/EEC and 78/659/EEC for the drinking water supply measure;
- Directive 91/271/EEC concerning urban waste-water treatment;
- Directives 86/278/EEC, 99/31/EC and 91/676/EEC for sludge and waste management;
- Directive 76/464/ EEC and the 7 daughter directives on pollution caused by certain dangerous substances discharged into the aquatic environment.

The measures are based on national, regional and local strategies.

The evolution of pollutant loads (2006-2015) resulting due to the implementation of reduction measures against the effects of significant points pressures due to human agglomerations is presented in Fig. 3.

"Fig 3" The evolution of pollutant loads (2006-2015) due to human agglomerations



"Tab. 1" Total investment cost for each type of measures

Type of measure	Total investment cost (mil. €)
Water supply system: rehabilitation / modernization / extension	214
Sewage system: rehabilitation / modernization / extension	256
Water treatment stations: construction, extension and/or modernization	131
Sludge management	51
TOTAL	652

4. MEASURES FOR REDUCTION OF THE POLLUTION DUE TO INDUSTRIAL ACTIVITIES

The measures for reducing the effects of the pressures caused by outlets of industrial provenience aim the conformation of the EU requests in the field of water management. These measures apply to the industrial units according to the following criteria:

- outlets in the water resources (direct or in the sewage system);
- type of pollution (points / diffuse sources / both);
- type of industrial activities (industrial activities which are subject to specific directives; monitored industrial activities by permission acts and a compliance plan.

The basic measures were established aiming the reduction of pollution caused by points and diffuse sources:

- Directive 76/464/EEC and 7 daughter directives modified and completed by D. 2006/11/EC;
- Directive 96/61/EC concerning integrated pollution prevention and control (IPPC);
- Directive 96/82/EC on the control of major-accident hazards involving dangerous substances (Seveso II);

- Directive 2006/118/EC on the protection of groundwater against pollution caused by certain dangerous substances;
- Directive 91/271/EEC concerning urban waste-water treatment, modified by Directive 98/15/EC;
- Framework Directive on Waste 75/442/EEC;
- Directive 91/689/EEC on hazardous waste;
- Directive 1999/31/EC on the landfill of waste;
- Directive 2000/76/EC on the incineration of waste.

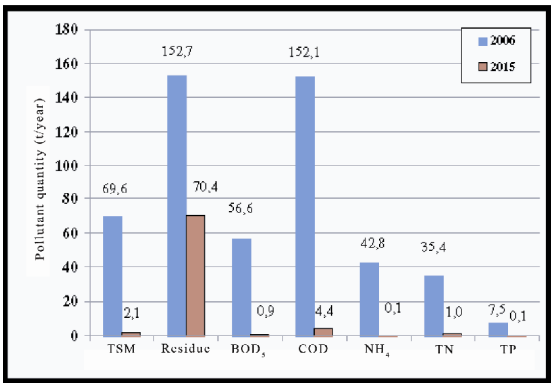
"Tab.2" Total investment cost for each industrial sector

Nr. crt	Industrial sector	Costs (mil. euro)
1	Mining industry	30,076
2	Chemical industry	0,2
3	Wood industry	0,056
4	Food industry	0,344
5	Oil industry	0,086
6	Paper industry	1,199
7	Metallurgical industry	3,456
8	Other industries: energy	3,071
9	Other industries: waste	1,156
10	Other industries	5,116
TOTAL		44,759

5. MEASURES FOR REDUCING POLLUTION DUE TO AGRICULTURAL ACTIVITIES

These measures were established aiming the reduction of pollution caused by the points and diffuse sources:
- Directive 91/676/EEC transposed by HG 964/2000 – approving the action plan for the protection of water resources against the pollution with nitrates resulted from agricultural sources;
- Directive 76/464/EEC and 7 daughter directives and Directive 80/68/EEC transposed by HG 783/2006 - HG 351/2005 – approving the program for step-by-step elimination of outlets, emissions and dissipation of priority hazardous substances;

"Fig. 4" Evolution of pollutant loads (2006-2015) due to the implementation of reduction measures against the effects of significant agricultural points pressures



- Directive 96/61/EC (IPPC) transposed by OUG 152/2005 and Law 84/2006 and;
- Directive 91/271/EC transposed by HG 188/2002 and completed HG 352/2005 and HG 210/2007 – approving some norms aiming the discharge conditions of waste-waters into the surface water.

"Tab. 3" Total investment cost for each type of measure

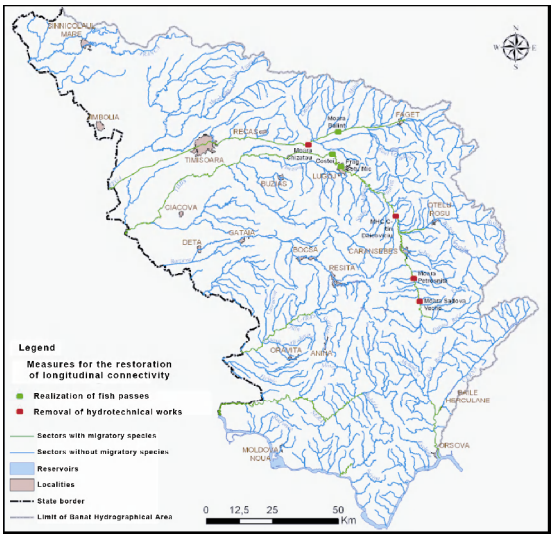
Name of specific measure	mil. €
Construction / rehabilitation of the waste-water collecting systems	0,18
Construction / modernization / extension / rehabilitation of the water treatment station	0,28
Construction/ impermeabilization of the storage pools for irrigation	11,07
Construction of storage platforms for dry bedded farmyard manure	4,80
Application of BAT – IPPC	4,53
TOTAL investments for measures against points pressures	20,87
Action programs for areas vulnerable to nitrate pollution	135
Reduction of pesticide emission	2,96
TOTAL investments for measures against diffuse pressures	137,96
TOTAL	158,83

6. MEASURES FOR REDUCTION OF HYDROMORPHOLOGICAL PRESSURES

Restoring the longitudinal connectivity:
- removal of obstacles;
- creating fish passes.

Improving lateral connectivity:
- restoring of wet zones;
- restoring of river beds;
- restoring of flood lands.

"Fig. 5" Measures for the restoration of the longitudinal connectivity



Restoring the natural processes:
- re-establishing the hydrological regime.

In the Banat Hydrographical Area there were selected 7 measures, for which the investment cost is 1.53 mil €.

The Banat Water Basin Administration is responsible for the realization of these measures, with financial sources provided by the state budget.

7. PLANNING OF THE TOTAL COST FOR THE IMPLEMENTATION OF THE PROGRAM OF MEASURES IN THE BANAT HYDROGRAPHICAL AREA

7.1. Basic measures

The basic measures are the minimal requests, imposed by the EU and Romanian legislation in order to protect the water resources from the effects of all types of pressures.

"Tab. 4" Investment cost for basic measures

Type of pressures	Total investment cost for basic measures (mil. Euro)		
	2010	2015	2021
Human agglomerations	446,16	187,95	700,47
Industries	11,41	33,35	0
Agricultural	3,37	155,43	0
Hydrological	0	0	0
Morphological	0	0	0
Others	0	0	0
Total	460,94	376,73	700,47

7.2. Supplementary measures

The supplementary measures are identified and implemented in addition to the basic ones in order to achieve the objectives established by art. 4 of the WFD (legislative, administrative, economical or financial instruments, environmental agreements, emission control, code of good practices, reestablishment of wet zones, caption control, necessity management, construction projects, rehabilitation, education, information, etc.).

"Tab. 5" Investment cost for supplementary measures

Type of pressures	The investment cost for supplementary measures (mil. Euro)		
	2010	2015	2021
Human agglomerations	0	2,63	1,82
Industries	0	0,04	0,30
Agricultural	0	0,25	0,38
Hydrological	0	0	0
Morphological	0	0,28	1,25
Others	0	0	0
Total	0	3,19	3,76

7.3. Combination of basic and supplementary measures

87% of the financial support is budgeted for measures applied to human agglomerations and for measures providing the water services for the population.

"Tab. 6" Total investment cost for each type of basic and supplementary measures

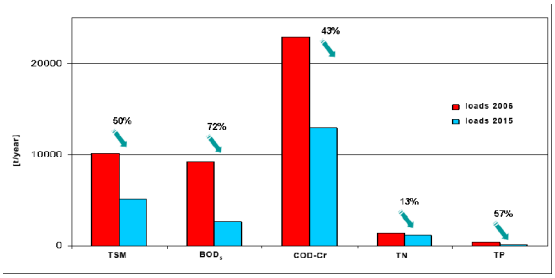
Type of pressures	Total investment cost for all measures (mil. Euro)		
	2010	2015	2021
Human agglomerations	446,16	190,58	702,30
Industries	11,41	33,39	0,30
Agricultural	3,37	155,68	0,38
Hydrological	0	0	0
Morphological	0	0,28	1,25
Others	0	0	0
Total	460,94	379,92	704,23

CONCLUSIONS

The forecast efficiency of the implementation of program of measures in the Banat Hydrographical Area (Fig. 6) offers the benefit of load reduction in the surface waters (expected load in 2015):

- reduction of TSM load with 50%
- reduction of BOD_5 load with 72%
- reduction of COD-Cr load with 43%
- reduction of TN load with 13%
- reduction of TP load with 57%

"Fig 6" The efficiency forecast of the implementation of program of measures in the Banat Hydrographical Area



All these issues above show that the implementation of the Program of Measures will bring an improvement on the quality of waters, their goals being the achievement the "good status" for water until 2015. The proposed measures concerning the sustainable utilization of the water resources will lead to the achievement of the environmental objectives.

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