SOME ISSUES REGARDING THE IMPLEMENTATION OF WATER FRAMEWORK DIRECTIVE IN ROMANIA

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Abstract: The Directive 2000/60/EC of the European Parliament and of the Council (Water Framework Directive) establishing a new strategy and policy in the field of water management states the necessity of the harmonization of social-economical system development with support capacity of aquatic environment, being the first EU "sustainable development Directive".

The implementation of the Water Framework Directive in Romania, similar to other European countries is a very complex, difficult and challenging process.

The paper comprises the implications of the implementation of the Water Framework Directive in Romania from legislative, organizational, scientific and technical point of view. A special attention is paid to the organizatorical structure for the implementation of this Directive in Romania and to its tasks. There are also presented some issues on the identification and characterisation of river water bodies types, on the re-designing of the existing National Water Monitoring System and other steps which Romania has undertaken in order to meet the requirements of the Water Framework Directive.

***Key Words*:** Water Framework Directive, sustainable water management, Interministerial Council of Water, river types, monitoring system.

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1. Introduction

Admitting that **"water is not a commercial product like any other, but rather a heritage which must be protected ..."** the Water Framework Directive (WFD) establishes a new strategy and policy in the field of water management which states the necessity of the harmonization of social-economical system development with support capacity of aquatic environment .

Thus, the WFD is the first EU "sustainable development Directive", a challenging tool that will have long-term consequences for both future water management and aquatic ecosystems throughout Europe, leaving behind the old sectorial approaches and management practices.

The EU WFD has come into force on 22 December 2000, being legally binding for all 15 Members States of the European Union as well as part of the Acquis communitaire for negotiation on EU enlargement for the Candidate countries and has as main objective the achieving of "good status" to all waters within a certain framework of time (15 years for the EU countries and for accession countries Union this will be negotiated on an individual base).

The implementation of WFD has a distinctly spatial dimension – the river basin, covering all the types of impact on waters, addressing water protection in a much more holistic way than past policies and bringing some revolutionary elements among which the following are mentioned:

- The setting of the objective of good status;
- The characterisation of water status into 5 classes is based on biological elements which are considered as "leading elements";
- The defining of reference conditions for each type of water bodies;
- The defining of a new category - heavily modified or artificial water bodies;
- The integration of surface with groundwater and of the relations between them and wetlands and other water-related ecosystems;

- The clarification of river rehabilitation concept through the defining of environmental objectives, reference conditions and heavily modified or artificial water bodies;
- The implementation of WFD raises some difficulties and challenges for the solving of which a common understanding and collaboration between the involved parts is proved to be crucial.

2. The implications of the implementation of Water Framework Directive in Romania

In Romania the development of water management had covered three important stages:

- Stage I: till 1974: Quantitative management of water – the quantitative control of water;
- Stage II: 1974-2000: Quantitative and qualitative management of water – the quantitative and qualitative control of water;
- Stage III: 2000 The sustainable management of water: the quantitative and qualitative control of water and healthy ecosystems;

The Water Framework Directive represents the basis for a new stage in the field of water management, respectively that of sustainable management. Also, the Water Framework Directive states the obligation for each country to elaborate a River Basin Management Plan.

In the case of the Danube River Basin District a single, basin-wide co-ordinated River Basin District Management Plan will be worked-out under the "umbrella" of International Commission for the Protection of the Danube River (ICPDR), based on Water Management Plans on national level submitted by each Danubian EU and accession countries.

In the case of Romania, the Water Management Plan on national level will represent a synthesis of the eleven Water Management Plans on river basins (fig. 1). The Water Management Plan for Romania will be included in the Water Management Plan for the Danube Basin District.

The implications of the implementation of the WFD Romania are to be found in the legislative, organizational, scientifical and technical fields.

From legislative point of view it is necessary to amend the existing Water Law 107/1996 and other environmental decisions and standards for their harmonisation with the provisions of WFD and other European Directives.

From organizatorical point of view for the implementation of the WFD and of the other directives regarding the water protection, the Interministerial Council of Waters at the level of the Ministry of Waters and Environmental Protection has been set up. It is made up of representatives of ministries, competent central authorities and of representatives of the National Company "Apele Romane" (fig. 2). This Council has a President who is also the representative of Romania in the ICPDR and a Secretariate. The tasks of the Interministerial Council of Waters on the implementation of the EU WFD are the following:

- to draw up the Action Plan on the implementation of the EU WFD and following its fulfilment;
- to ensure the co-operation between the involved units in the process of the implementation of the EU WFD and facilitating the exchange of information;
- to maintain the connection with the Water Directors Committee of the European Commission and with the Water Management Expert Group of the ICPDR on the unitary implementation of the EU WFD at the level of the Danube Basin and on the co-ordination of the implementation of the WFD at the level of European Union (EU);
- to report to the ICPDR and to European Commission the way of implementation of the EU WFD in Romania;

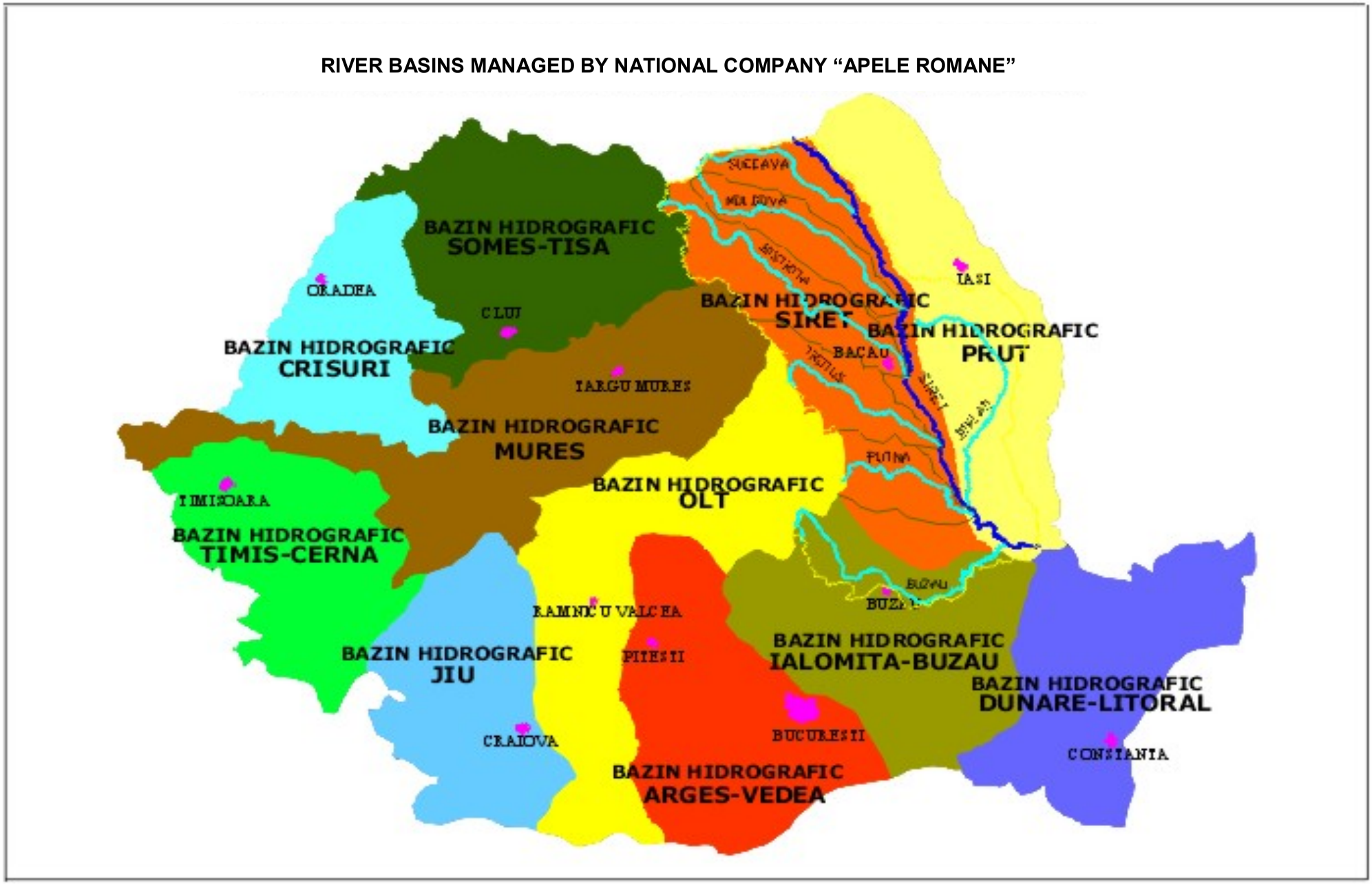

Figure 1. The implementation of the Water Framework Directive on river basins

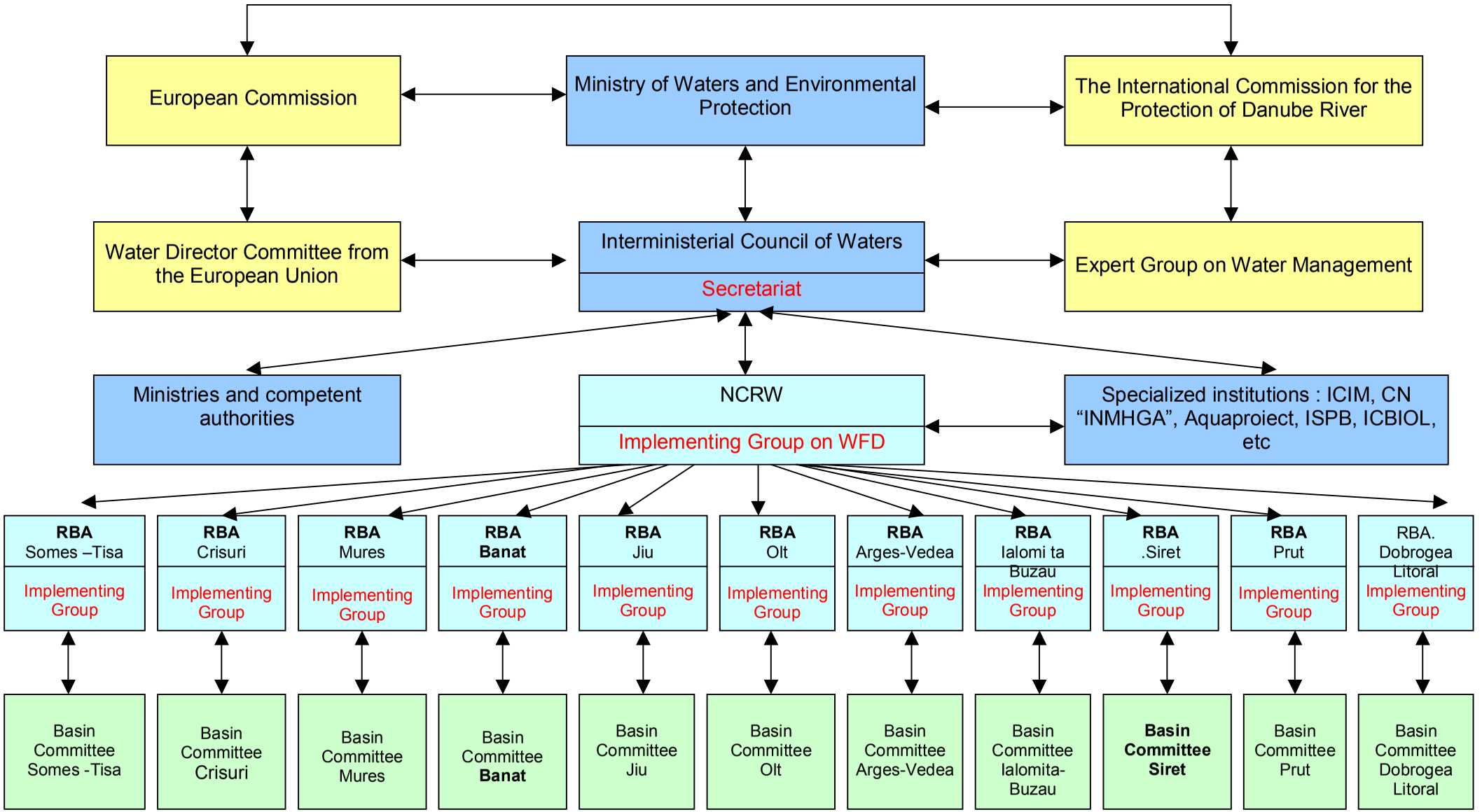

Figure 2. Organizatorical structure for the implementation of the Water Framework Directive in Romania

- to co-ordinate the activities and the measures of the Water Management Plan on River Basin for the transboundary river basins, which falls under the incidence of the provisions of the bilateral agreements between Romania and neighbouring countries;
- to agree on the Water Management Plan for Romania;
- to submit the Water Management Plan of Romania to the approval of the Ministry of Waters and Environmental Protection and of the Government of Romania;
- to ensure the unitary implementation of the provisions of the Water Management Plan in Romania, through the representatives of ministries and of the central competent authorities.

The specialised institutions in the field of water will have contributions to the drawing-up of some chapters of the River Basins Management Plans.

In art. 3 (2) of WFD it is stated that:" Member states shall ensure the appropriate administrative arrangements, including the identification of the appropriate competent authority, for the application of the rules of this Directive within each river basin district lying within their territory ".

In accordance with this provision, in Romania there was identified the competent authority for the implementation of WFD by the Minister Order 913/15.10.2001, respectively the National Company "Apele Romane" and its River Basins Authorities, having as tasks the following:

- to draw up the River Basins Management Plans and the Water Management Plan of Romania;
- to submit the River Basin Water Management Plans in order to be agreed by the Basin Committees;
- to implement the other Water Directives of the European Union;
- to transmit reports to the Interministerial Council of Waters regarding the implementation of the EU WFD;
- to develop the activity of water monitoring in respect to the provisions of the EU WFD;

In order to accomplish these tasks, interdisciplinary implementation teams at the level of CNAR and River Basin Authorities have been set-up.

From scientifical point of view the specialised institutions from the field of water management must modify their activity plan in order to perform research which is necessary for the implementation of WFD. Also these institutions have to adapt the guidelines and methodologies elaborated at European level to the specific conditions of Romania.

From technical point of view, the development of the monitoring activity by performing the analysis in accordance with the requirements of WFD, there are nedeed important financial resources of about 3,800,000 US$ used for **analyses** and as well as for the **equipping with observations, measurements and sampling devices**. At the same time it is necessary to hire specialized personnel especially biologists. The organisating of training courses for the staff involved in the implementation of the WFD and other European Directives is also a necessity, as well as the equipping of the WFD implementation teams with GIS software.

3. Identification and characterisation of types of river water bodies in Romania

One of the major steps in the implementation of WFD is represented by the identification and characterisation of types of river water bodies as a prerequisite of the new monitoring network design.

The identification and characterisation of river types in Romania is based on two approaches:

- *Top-down/* cause-effect approach based on the use of parameters supposed to be related to community compositions;
- *Bottom-up* / effect-cause approach based on direct measurements of the variability of the community;

Regarding the abiotic typology there has been chosen the typology features provided by the system B (Annex II of the WFD), mainly represented by:

- Obligatory parameters: altitude, geology, size of the catchment area
- Optional parameters: river discharge flow category, transport of solids, mean air temperature, precipitation, to which supplementary parameters have been added
- Relief structure, soil dominant structure, potential vegetation, distribution of land use, specific vulnerability (erosion, pollution), natural resources (forests, fossil fuels, etc), flow potential index, mineralisation degree of water, the main anthropogenic activities.

In the case of optional parameters the "integrating" parameters which are important for the development of type-specific aquatic community have been preferred.

The usage of these parameters in GIS format have lead to the delineation of the 22 ecoregions of order I (including the undetailed ecoregion of the Black Sea) in Romania /2/.

These ecoregions of order I along with the detailed structure of the soils and vegetation represent the basis of the delimitation of river types, a number of 58 river water bodies types being differentiated in Romania.

The approach bottom-up has taken into account the species composition and abundance of macroinvertebrates, phytoplankton and fish fauna, the GIS - abiotic data files going to be completed, in this way, with data on biodiversity.

The analysis, combining, overlapping of the river water bodies types based on abiotic approach with those based on biotic approach will lead to the delimitation of river water bodies types in Romania.

4. The re-designing of existing National Water Monitoring System according to the provisions of the WFD

Another important implication of the implementation of WFD in Romania is represented by the adaptation of the existing water monitoring system and assessment to the provisions of WFD.

The new water monitoring and assessment strategy founded by the Water Framework Directive has as basis the main following principles:

- ecosystem approach
- biological approach
- classification dependent on the deviation from the type-specific reference conditions ;

The water monitoring strategy provided by WFD is laid on a new concept of integrated water monitoring, with a significant shift towards a dominant ecological perspective, involving a triple integration:

- of the investigation areas on river basin level : surface water in natural regime (rivers, lakes, transitional water, coastal water),heavily modified and artificial water bodies , protected areas and effluents;
- of investigation media : water, sediments to which biological components (biota) are integrated;
- of monitoring parameters: biological, hydromorphological and physical-chemical ones from qualitative and quantitative point of view.

The ecosystem approach which is one of the key elements of the "philosophy" of this directive considers water not as a resource for multiple uses but as an ecosystem with intrinsic ecological value presenting two major compartments: water and sediments to which biological components are integrated. Within the ecological approach the characterisation and the assessment of both biotic factors and abiotic factors (hydromorphological and physical-chemical components) between which complex interactions and feedback relations exist, are performed.

The biological elements are considered “leading elements” in the monitoring and assessment activities, taking into account the following:

- Information on the health of ecosystems and on objectives related to different uses (aesthetic, recreational, ecological) are expressed through the biological components;
- The integration and the synergistic repercussion of all types of impact and over a longer period of time in comparison with chemical components;
- The actual number of substances present in surface water exceeds the number of measured substances. For many priority substances no analysis methodology is available or concentration of these substances is below the detection level, the only expression of the effects being the repercussion on the biological elements;

The principle of classification dependent on the deviation from the type-specific reference conditions indicates that the classification of the ecological status is undertaken by comparing the status of quality elements of a water body to that of quality elements from reference conditions. It was decided to use the type-specific natural conditions as a reference in the case of a “natural water body” and in the case of artificial and heavily modified water bodies the “maximum ecological potential “ was defined as reference conditions.

Regarding the monitoring programme towards the harmonisation with the provisions of WFD it is necessary the completion and the development of the existing monitoring programme in Romania as follows:

- The completion of the monitoring areas with:
  - protected areas (areas designated for the abstraction of water intended for human consumption under Article 7; areas designated for the protection of economically significant aquatic species;
  - bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC; nutrient-sensitive areas, including areas designated as Vulnerable Zones under Directive 91/676/EEC and areas designated as Sensitive Areas under Directive 91/271/EEC; areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Nature 2000 sites designated under Directive 92/43/EEC [1] and Directive 79/409/EEC [2]);
  - artificially and heavily modified water bodies ;
- The completion of investigation media with that of sediments;
- The completion of monitoring elements with:
  - from biological point of view –macrophytes, phytobenthos, fish fauna;
  - from chemical point of view - priority and priority hazardous substances;
  - from hydro-morphological point of view – interactions of surface water with groundwater, longitudinal profile, granulometry of river bed, of shore and limitrophic area;

Following the principle “ecosystem approach”, the completion of investigation media with that of sediments has been started in year 2001, in the first stage being selected on the national level, a number of 99 preliminary monitoring sections out of which 66 are located in lakes and reservoirs, 11 within the Transnational Monitoring Network for the Danube river (TNMN) and 22 in coastal waters. Also the monitoring of suspended matters in the case of transboundary watercourses (30 sampling sections out of which 4 are located within TNMN and 26 in other transboundary watercourses) has been approached, further to be extended in the future.

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[1] OJ L 206, 22.7.1992, p. 7. Directive as last amended by Directive 97/62/EC (OJ L 305, 8.11.1997, p. 42).

[2] OJ L 103, 25.4.1979, p. 1. Directive as last amended by Directive 97/49/EC (OJ L 223, 13.8.1997, p. 9).

The sediment parameters that will be monitored in this stage are represented by the pollutants: heavy metals (Cd, total Cr, Cu, Hg, Ni, Pb, Zn), As, PAH, PCB (summ of 7) the monitoring frequency being 2 times/year.

The development of monitoring programme takes also into account the priority substances included in the list from Official Journal dated on 15.12.2001 through the Decision no. 2455/2001/EC of the European Parliament and Council 20 Nov. 2001.

As a first step an inventory on national level had been carried out, which has taken into account 167 economic units which are major potential pollution sources with priority substances, being at the same time a criterion for the design of sediment monitoring network. The original list containing 33 priority substances was extended to 35 substances and groups of substances, in case of Romania, based on the data regarding the Danube river pollution on the Romanian monitored sector. It has been noticed that out of 35 priority substances the following 7 are not used by economical agents in Romania: C_{10-13}-chloroalkanes, Chlorfenvinphos, Hexachlorobenzene, Hexachlorobutadiene, Pentachlorobenzene, Pentachlorophenol, Tributyltin compounds (forbidden to be used in Romania for the last 30 years).

Regarding the water and sediment quality assessment a new systems will be applied in Romania which brings new elements in the light of classification system of the EU WFD. This has as basis the EU PHARE Multicountry Programme for Environment entitled “Danube River Basin Water Quality Enhancement” (1999), which was elaborated in the light of the coming EU Water Framework Directive at that time, in order to help the experts of International Commission of Protection of the Danube River to produce a common system for the classification and characterisation of water and sediment quality.

In Romania, similar to situation of other European countries from the Danube river basin, there was no standard for sediment quality and also at the European level river sediment quality classification is less standardised than water quality classification. The values provided by this system of water and sediment quality assessment and classification elaborated within this project were divided into five categories and were adapted to the specific conditions of Romania, bringing as innovative elements the defining of reference class and target values for 11 determinands in the case of sediments and 40 determinands in the case of water.

Regarding the biotic components compartment up to now there is no country in Europe which already has elaborated yet an overall method to assess the ecological status for different kinds of water bodies taking into account all possible impacts and their effects on the whole aquatic ecosystems as well as all biological elements mentioned in the WFD. In the case of biotic components integrated to the sediment there is a long tradition in many European countries to assess the organic pollution by analysing the benthic macroinvertebrates (the saprobic system which is used by most of Danubian countries or biotic indices). In Romania the classification and assessment of water /sediment quality of inner rivers is done by using the Knopp method based also on the saprobic system. Preparations for developing a new classification and assessment method of macroinvertebrates based on saprobic system have already started in Romania, being obvious the fact that efforts have to be made to co-operate and to harmonise methods as much as possible throughout Europe. It is also therefore recommended to raise all Danubian countries to the same experience level by training courses, co-operation, information exchange and intercalibration exercises.

The table below (no. 1) is given an overview on the existing biological monitoring programme in Romania and on that provided by the WFD, referring to water categories, monitoring elements and frequency.

Table 1- The biological elements monitored and frequency within the existing biological monitoring system and that indicated by WFD

	Rivers Existing WFD		Lake Existing WFD		Transitional water Existing WFD		Coastal water Existing WFD	
Phyto-plankton	YES	YES	YES	YES	NO	YES	YES	YES
Frequency	3 mths	6 mths	3 mths	6 mths		6 mths	3 mths	6 mths
Macrophytes	NO	YES	NO	YES	NO	NO	NO	NO
Frequency		3 years		3 years				
Phytobenthos	YES	YES	NO	YES	NO	NO	NO	NO
Frequency	6 mths	3 years		3 years				
Macroalge	NO	NO	NO	NO	NO	YES	NO	YES
Frequency						3 years		3 years
Angiosperms	NO	NO	NO	NO	NO	YES	NO	YES
Frequency						3 years		3 years
Zoobenthos	YES	YES	YES	YES	NO	YES	NO	YES
Frequency	3 mths	3 years	6 mths	3 years		3 years		
Fish fauna	NO	YES	NO	YES	NO	YES		
Frequency		3 years		3 years		3 years		

As it can be seen from the above, it is necessary to extend the existing monitoring programme to other biological components e.g: phytoplankton (for transtional), macrophytes (for rivers and lakes), phytobenthos for lakes, macroalgae and angiosperms (for transitional and coastal waters), zoobenthos for transitional waters, fish fauna (for rivers, lakes, transitional waters) and to adjust the frequency to that provided by WFD.

The implementation of Water Framework Directive in Romania like other countries in accession process to the European Union is a continuous and greatly important activity which will be achieved step-by step involving significant human and financial resources and requiring to the co-ordination of all the involved parts at all international, national and basin level.

5. References

*** *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy,* Official Journal of the European Communities.

Vadineanu & all (1992): *The ecological regionalization concept and delineation of Romania`s ecoregions,* Environmental Magazine,Research and Engineering Institute for Environment printing , Bucharest, Romania.

Stadiu, F., Serban, P., Jula, G. (2001): *The implementation way of the Water Framework Directive in Romania,* Hidrotechnica Magazine, National Company “Apele Romane” printing, Bucharest, Romania.