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Water framework directive and water policies in France: Evolution and tools for a rational use of water resources

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Abstract. In France water management, in terms of quality and quantity, is based on the Water Framework Directive (WFD), the national legislation, the use of appropriate tools and the involvement of relevant stakeholders (institutional and local). This article reviews the institutional water management in France and in Europe as well as the new trends of the French system following the introduction of the European principles of water management. The pre-existing French institutional, economic and planning tools have been modified and the roles of water stakeholders have changed in order to fully meet the WFD expectations. Considering the actions carried out to promote a more rational resources management throughout the French Mediterranean region (Rhône-Mediterranean-Corsica river basins), this article shows how the French system has finally developed large-basin water policies. Some examples are given about water quantitative management and rational use with the support of technological innovation.

Keywords. Water Framework Directive (WFD) – Water management tools – Water agency – Governance – Consultation – River basin.

Directive cadre sur l'eau et politiques de l'eau en France: évolution et outils pour une utilisation raisonnée des ressources en eau

Résumé. En France, la gestion de l'eau, sur le plan qualitatif et quantitatif, repose sur la Directive Cadre sur l'Eau (DCE), la législation nationale, l'utilisation d'outils appropriés et la mobilisation des acteurs concernés (à l'échelle institutionnelle et locale). Dans cet article, on passe en revue les aspects institutionnels de la gestion de l'eau en France et en Europe, et les nouvelles orientations du système français suite à l'introduction des principes européens. En effet, les instruments institutionnels, économiques et de planification existants ont été modifiés et on est également intervenu sur le rôle des acteurs pour satisfaire les exigences de la DCE. Compte tenu des actions entreprises pour promouvoir une gestion plus raisonnée des ressources en eau dans la région méditerranéenne française (bassins hydrographiques Rhône-Méditerranée-Corse), cet article montre qu'en France, des politiques de l'eau ont été mises au point pour les grands bassins. Des exemples sont illustrés sur la gestion quantitative et l'utilisation rationnelle de l'eau à travers l'innovation technologique.

Mots-clés. Directive Cadre sur l'Eau (DCE) – Outils de gestion de l'eau – Agence de l'eau – Gouvernance – Consultation – Bassin hydrographique.

I – Introduction

From 1964 to 2007, several laws were issued in France to set water management in a proper institutional framework.

The law of December 16 1964 provided the basis for a modern principle of river basin management. The implementation of this law led to the establishment of six basin organizations.

Almost three decades later, the Water Law (1992) significantly changed the French water management system with the establishment of the SDAGE (River basin management plans).

In 2000, the WFD took up this principle of management and planning at the basin level.

Until 2006, several national provisions adapted the French water management system to the European rules.

After describing how the French legislation has evolved over the last forty years, this article reviews the main changes in the institutional system and the new tools which allow today an integrated water management.

II – Discussion

1. Towards integrated water management in France and in Europe from 1964 to 2007

- The **law of 16 December 1964** provides the basis for a modern principle of water management by catchment areas. It lays down three main principles that are now generally recognized but which were very innovative at that time:
 - A decentralized management at the level of large catchment areas;
 - A joint management by a local board bringing together local authorities, water stakeholders, representatives from the public administration concerned with water issues;
 - Incentive financial tools for a good qualitative and quantitative management.

The application of these principles represents the first approach to resources preservation within the limited frame of the catchment area. The notion of potential reserve waste due to pollution discharged into the environment and the taxation of water volumes through water charges are aimed at saving water and reducing water demand .

Thus, the French national territory is divided into six large “River Basin Districts” corresponding to the six French Water Agencies of Adour-Garonne, Artois-Picardie, Loire-Brittany, Rhine-Meuse, Rhône-Mediterranean-Corsica and Seine-Normandy.

- The **law of 3 January 1992** entails a shift from a policy based on facilities, as defined by the text of 1964, towards a policy of the environment to support planning and global management aimed at some specific objectives.

This law sets forth the following principles:

- the heritability of water,
- the global and interconnected management of water resources (in all forms, surface water, groundwater, coastal marine water involving all the users),
- the conservation of the aquatic ecosystems and of the wetlands;
- the consideration of water as an economic resource which deserves being enhanced for its different use.

The main management tool is the Water Development and Management Master Plan (or *SDAGE* in French) which, at the basin level, represents the framework and specifies the guidelines for management and planning over a period ranging from 10 to 15 years.

In the sub-basins, a Water Development and Management Plan (or *SAGE* in French) is applied; it is backed by the local stakeholders for water resources management and protection on a local scale.

- The **Water Framework Directive** (WFD), issued in October 2000, reflects the willingness to implement an innovative approach towards water management in Europe. The main objective is to achieve a good ecological status of all water bodies by 2015 and more specifically:
 - The sustainable management of water resources;
 - The prevention of any deterioration in the aquatic ecosystems;
 - Catering for a sufficient supply of good-quality drinking water;
 - Reducing groundwater pollution;
 - Reducing and ultimately eliminating the discharge of priority hazardous substances;
 - Contributing to mitigate the effects of droughts and floods.

To achieve the above objectives three principles shall be taken into account:

Programming and planning: Planning in each district is based on some key steps that should be revised every six years: the elaboration of an assessment plan and a programme of measures that allows to achieve the objectives of the management plan (Water Development and Management Plan in France).

The programme of measures encompasses the main actions that are to be launched by 2015. Adopted by the prefect coordinating the catchment basin, this programme provides guidance for the actions that shall be taken by the partners and the public services in the catchment area. It specifies the time frame of the main measures and lists the regulatory provisions, the financial incentives that are provided and the contractual tools available.

Since the programme of measures is a tool for the implementation of local measures, the directive specifies that the general public – e.g. all the citizens, among whom the water users- should be involved at all stages in the adoption of the management plan and the programme of measures.

It defines three periods of compulsory consultation: 2006, 2007 and 2008.

France has opted for providing information/consultation since 2004 during the work-out phase of the water bodies' assessment (1st phase of the WFD).

The economic analysis: although with a few legal constraints, the WFD foresees an economic analysis at all stages of its implementation (assessment, grounds for derogation to the objectives, optimization of investment choices and pricing).

The principle of costs recovery: water pricing should represent the technical and environmental costs and should include the polluters-pay principle for each of the three large groups of users i.e. the communities, the industries and the farmers. Attractive water pricing should be applied before December 2010.

- The **law for transposal of the WFD** (21 April 2004): this text set very ambitious objectives for the country:
 - Achieve a good ecological status of water bodies by 2015;
 - Reduce, even eliminate, the discharge of hazardous substances;
 - Secure public participation in policy working-out and monitoring;
 - Take into account the principle of recovering the costs of the services related to water use.

The present situation in France is not satisfactory. And the assessment made over the last years by the Water Agencies and the Services of the Ministry of the Environment demonstrated that further efforts are needed before 2015. Indeed, the good ecological status is only achieved for some

50% of the water bodies due to the point sources and diffuse pollution that are poorly managed and to the imbalance between water demand and water supply, which is even stronger during the drought period (summer 2003, for example). To achieve the objectives set, the transposal law completes the procedure for working out the SDAGE (Water Development and Management Master Plan) that should be updated before the end of 2009. It confirms the role of the Basin Committee in setting the water policy objectives at the river basin level. The actions that should be carried out are specified in the programme of measures.

- The **Law on water and the aquatic environments (LEMA)** was issued on December 30 2006. This law was based on two fundamental objectives:
 - Provide the administration, the local communities and the water stakeholders, in general, with the tools to recover water quality; achieve by 2015 the objective of a good ecological status set by the WFD; get a better balance between water resources and needs with a view to achieve a sustainable development of economic activities that exploit water and a closer dialogue with the community;
 - Provide the local communities with the tools to adapt the public drinking water and sanitation facilities to the new challenges in terms of transparency vis-à-vis the users and of environmental efficiency.

To reach the objectives of the French Water Policy specified in the legislation, the institutional system and the management tools need to be adapted.

2. Evolution of the institutional system and the main water management tools in France

According to the WFD principles, the French water policy is now defined on a partnership basis involving the State, all the local Communities and the users associated at each level, since it aims at providing a global management of the resources, by optimizing the needs fulfillment and preserving the aquatic ecosystems.

In France dialogue is institutionalized at **three levels**:

National Level: The National Water Council brings together the representatives appointed by a decree of the Ministry of the Environment upon a proposal made by the ministers, the users, the general and municipal councils, the administrations concerned and the relevant water experts.

The Minister submits to the Council all matters for which the Council has to express an opinion pursuant to the law amendments of 16 December 1964. The Water Division is in charge of the Council's Secretariat.

It is consulted for guidance on the national water policy and particularly, on the draft legislative and regulatory texts.

The ONEMA, The National Office for Water and the Aquatic Environments, is a national public establishment that falls within the public service of the environment. It was set up to encourage a global and sustainable management of water resources and aquatic ecosystems, recover water quality and achieve the objectives of a good ecological status set under the WFD.

Governance and basin districts: Article 13 of the WFD reads that "There are diverse conditions and needs in the Community which require different specific solutions. This diversity should be taken into account in the planning and execution of measures to ensure protection and sustainable use of water in the framework of the river basin. Decisions should be taken as close as possible to the locations where water is affected or used". The river basin is defined as the appropriate territorial level for water governance, conflict management, with water sharing based on the upstream and downstream uses at the heart of the dialogue process. Excessive upstream pollution or abstraction

has, indeed, serious consequences for downstream users. Water governance and management are interdependent and consequently, the governance system implemented has an impact on resources management and vice versa. In article 35, the WFD specifies that “Within a river basin where use of water may have transboundary effects, the requirements for the achievement of the environmental objectives established under this Directive, and in particular all programmes of measures, should be coordinated for the whole of the river basin district”.

The BASIN COMMITTEE, which brings together the different public or private stakeholders acting in the water sector, is designed to jointly discuss and broadly define the policies on water resources management and protection of the natural aquatic environments. It includes the representatives of local communities (40%), the representatives of social and professional organizations and the user organizations (40%) and the State representatives (20%). The committee is responsible for promoting the dialogue since water governance actually depends upon its achievements. The board of the water agencies stems from the Basin Committee, except for the Committee’s chairman who is appointed by the Government. The Government provides guidance on the activities that will be carried out by water agencies and participates in their financial decisions. Since 1992, the Basin Committee has become responsible for the elaboration of the Water Development and Management Master Plan (SDAGE), before its submission to the Government for its approval. The Government follows its implementation and gives its opinion on the schemes defined in the Water Development and Management Plan (SAGE). Pursuant to the law of 21 April 2004, annexed to article L 212-1 of the Environment Code, “Each basin or group of river basins has one or more SDAGE to work out the main lines of a balanced water resources management (...) and define water quantity and quality objectives”. These SDAGEs must be submitted every six years and they can be used to challenge any administrative decision in the water sector; therefore, they have to be in line with town planning. A decree dated 17 March 2006, specifies the SDAGE contents. In accordance with the SDAGE and “to achieve the objectives of the WFD, [...] a programme of measures describing the means and the actions to be implemented should be drawn up”.

The Basin Committee is consulted by Water Agencies to determine the rates and the criteria for water charges paid on abstractions and discharge. These rates and charges are introduced at the basin level, and are included in the priorities of the agencies’ action plan to decide how they can be used for investments and operation of public and private water treatment facilities.

Water agencies are managed by a Board that includes: 8 representatives from the local communities, 8 representatives from the different categories of users, 8 State representatives, 1 representative from the Agency’s personnel.

The Chairman of the Board and the Agency’s Director are appointed by the Government.

The scope of their activities can be summed up as follows:

- Providing the financial contribution for the execution of all types of works, construction and management of the facilities that meet the needs set by the Basin Committee;
- Identifying priorities for research on water issues that the agencies must develop

Water Agencies’ financial resources derive from the application of the “user-polluter-pays” principle that enable them to collect the charges on abstraction and discharge from all the users that affect water quality by modifying the water regime.

The Water agencies’ role consists in supporting actions at the river basin level by granting incentives to the local owners who carry out activities complying with the objectives set by the agencies. To achieve this purpose, the agencies rely on the links established with the local stakeholders and look for support by consortia to promote the SAGE or the environment contracts. They can sign framework agreements that are binding for partners from the institutions

and the land management sector: the regions, the departments, the town communities, the Public Territorial Basin Establishments, etc. These tools are designed to reinforce collaboration and dialogue.

The water agencies also play a role in disseminating information and raising public awareness. The law for the adoption of the WFD dated 21 April 2004 stipulates that the basin committee is responsible for collecting public opinion on the SDAGE project, "The basin committee can modify the project to take into consideration the opinions that are expressed". The objective of the governance model implemented in the six basins is to ensure proper coordination of various stakeholders. The system that involves the agencies and the basin committees is designed to ensure representativeness of the stakeholders and to foster joint actions. Public participation must allow raising awareness of the measures adopted, or even amending these measures.

At the level of affluents and sub-basins corresponding to a hydrographic unit or an aquifer, a local Water Commission can be set up, where half of the members are representatives from the local communities, one quarter includes users' representatives, and one quarter encompasses the State representatives, and which will be in charge of preparing and supervising the application of the Water Development and Management Plan (SAGE).

The Water Development and Management Plan sets the general objectives for the use, the development and the quantitative and qualitative protection of surface water and groundwater resources and the aquatic ecosystems as well as for the preservation of the wetlands, in order to comply with the principles established by the law. Its extent is defined by the master plan, or if appropriate, by the State representatives, upon consultation with or upon proposal by the local communities and upon consultation with the basin committee.

Once the scheme has been approved, the administrative authorities must adopt consistent decisions in the area concerned, and along its perimeter.

The local communities involved can also act jointly within a Local Water Community to help achieving the objectives set under the Water Development and Management Master Plan.

The "Local Water Community" will be responsible for the assessment activities, the implementation and exploitation of all the works, facilities and plants of general or emergency interest, and will be in charge of:

- the development of a basin or a section of a catchment area;
- the maintenance and management of a non-national water course, including the access to the watercourses;
- the water supply;
- the management of storm waters and runoff waters;
- the floods and sea level control;
- the pollution control;
- the protection and conservation of surface and groundwater;
- the protection and reclamation of the sites, the aquatic ecosystems and the wetlands as well as of the neighbouring woodlands;
- the hydraulic facilities that contribute to civil security.

The tools and institutional systems mentioned above are used in France to develop the water policy. All the plans share the common objective of contributing, through the dialogue, towards a sound water management. Plans are intended only for planning and management. Financial tools,

such as the agencies subsidies, assist and support the stakeholders in applying the measures laid down in the plans and to obtaining tangible results.

3. Impacts of the water management system on the land and financial support to the projects: the role of Water Agencies

Based on the SDAGE and the programmes of measures, Water Agencies draw up action plans to achieve the SDAGE objectives. The action plan is a funding programme which establishes procedures to have access to subsidies. Financial support could be granted to master-builders, industry, local authorities, associations, farmers... for the implementation of measures recommended in the programme of measures. The Water Agency's action plan has to provide results as laid down by the WFD, and therefore, this leads to a selection of the financed actions.

There are six different programmes, adapted to the challenges of each basin and to the stakeholders' concern, but pursuing a single policy for a sound and sustainable management of water resources. The funds granted to the Ninth programme demonstrate how much the Government intends to support the water policy for the six next years. The subsidies amount to more than 11.6 billion Euros, excluding the subsidies and contributions to the National Office for Water and the Aquatic Environments, which replaces the Higher Council for Fishing and whose funding is provided by the water agencies. These programmes are fully funded through the water agencies' charges. The Law on Water and the Aquatic Environments has effectively reasserted the principles which are at the basis of the agencies' success, in particular the environmental taxation which has proved to be effective for 40 years, and relies upon the "water pays for water" principle.

Programmes are designed to achieve two main objectives:

- recover the time lost in France for the application of some European rules, especially, the municipal waste-water treatment directive of 1991, imposing the upgrading of all waste water treatment plants;
- implement the Water Framework Directive that applies a result-based logic to actions and sets out that water agencies must be more focused on local targeted actions and have to progressively increase the remedial actions in the aquatic environments.

To ensure proper resources protection and sustainable development of water-related economic activities, the French Minister recognizes the urgent need for strengthening water agencies' actions in several fields:

- Concerning drinking water, prevention must preferably be applied instead of curative actions, e.g. treat pollution at the source and take into account the objective of the National Health and Environment Plan to complete the scheme implementation in order to protect the water catchment areas from 2010;
- Control of diffuse pollutions is also a major challenge. This is why Water Agencies shall involve all the players upstream and the critical water bodies to implement reinforced territorial actions;
- As for the application of the management plan for water scarcity, the Water Agencies will take actions to reach a balance between the water uses and the resources available, including the development of innovative solutions and exploitation of the new resources;
- The amounts allocated to the management of the aquatic environments are tripled.

The Ninth programme has been elaborated based on a dialogue approach between the Ministry of Ecology and Sustainable Development and the basin committees that are the driving force for establishing a dialogue within the basins, involving the local stakeholders as well as the State services. The law on water and the aquatic environments is effectively reinforcing the

competencies of the basin committees that shall express their opinion on the programmes submitted by the agencies.

For example, the article shows some of the actions which could be financed by the RMC Water Agency during the period covered by the ninth programme (2007-2012) (Abstracts from the RMC Agency Intervention Programme)

✓ *Support sustainable actions of small enterprises: fight against industrial pollutions*

Less structured than larger enterprises, small companies find it difficult to reduce pollution and remove wastes with sustainable solutions and preserve the environment due to the lack of technology or the disproportionate treatment cost.

Along with the reduction of toxic pollution, one of the objectives of the ninth programme, the Water Agency intends to encourage small enterprises by promoting research development and a technological platform to develop technical and collective solutions to create networks.

One of the aims of the programme is to support the development of waste treatment at the basin level and to make it financially accessible and sustainable for small enterprises.

Table 1. Subsidy rate for sustainable actions of small enterprises in pollution control .

Type of action	Subsidy rate
Application of a research and technology platform	30 to 50%
Removal of dangerous wastes for water	30% (for the first 10 tonnes per year
Waste reception centre (dangerous wastes)	30%

✓ *Support sustainable actions in agriculture*

The Agency supports initiatives to create or promote technology which will allow farmers applying a lower amount of fertilizers or pesticides, in particular in organic farming. Innovative technology must be adaptable to the regional context.

Technology promotion must demonstrate the benefits for the environment.

The subsidy rate averages 50%.

✓ *Rational use of water*

The Water Agency supports actions for saving or proper sharing of water resources (dams for example).

Savings should concern:

- For drinking water: less waste, leak elimination, rainwater collection for watering and outside washing, recycling of cleaning water...
- For agriculture: best irrigation management (a proper amount at the proper time for crops), crops best adapted to the climate conditions for lower water consumption ...
- For industry: targeted technology development, recycling of cold circuit waters...

Action for rainwater collection can be funded provided that they are collective actions supported by local authorities. The same actions can be financed in agriculture but only if they are collective and are carried out in accordance with the Rural Development Plan.

Furthermore, distribution between the various water uses can be rebalanced by modifying the dam management, according to the needs and the rainfall. Additional water flows can then be considered in the lowest water level period, to increase the flows into a river. The Agency can

help modifying the management of the hydraulic works only if the new management methods registered with a local authority.

Table 2. Subsidy rate for rational use of water.

Type of action	Subsidy rate
Water saving	30 to 50%
Optimization of hydraulic facilities for several uses (studies and works)	Up to 50%

✓ *Support general studies on research and development*

These studies will be aimed at:

- improving knowledge of the environment and the impact of human action, particularly in critical areas;
- following up or assessing the effectiveness of the operations supported by the Agency with respect to the state of the environment;
- evaluating the socio-economic aspects resulting from the preliminary study, with special emphasis on the relationship between the ecological state and the risks (public health, floods).

They will also cover technical and scientific themes of interest to the Agency's programme. Priority will be given to the projects which fall within the scope of the agreements signed between the Agency and the research organizations (IFREMER, CEMAGREF,...).

Table 3. Subsidy rate for supporting research and development.

Type of action	Subsidy rate
General studies	50%
Research and development	20 to 80%

III – Conclusion

In France the management of surface water and groundwater, considered as the “common heritage of the Nation”, is currently based on six main principles:

- Taking into account the geographic characteristics of the main catchment areas since “water knows no administrative boundaries”;
- Applying an integrated approach to fulfill the different needs and preserve the aquatic ecosystems;
- Fostering partnership and coordinating the actions of the Authorities and developers: indeed, this is the role of the six Basin Committees and the Prefects who coordinate the basin; this is also the objective of the Water Development and Management Master Plan (SDAGE) and the Water Development and Management Plan (SAGE);
- Using specific financial resources, in accordance with the six Water Agencies' mission, since “water has to pay for water” and the users-polluters shall be the payers,
- Planning on a multi-year basis the priority investments in the framework of the ninth programme of the Water Agencies (2007-2012) and the river contracts;
- Considering the competencies of each public or private owner, in compliance with the framework set by the law.

These principles provide a solid foundation for technology development allowing a rational use of water resources, the implementation of good practices and the establishment of a dialogue among the stakeholders.

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