

# Public Participation in the Dordogne River Basin

Case study report produced under Work Package 5



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## Executive Summary / Main Findings

The Dordogne river basin is located in southwest France, covering 24,000 km<sup>2</sup>, i.e. 20% of the hydrographic district Adour-Garonne in its northern part. The Dordogne is 450 km long, and crosses 6 *départements* (counties) and 4 different administrative regions. Above one million people live in this basin. Presently, the major water uses are hydroelectricity (more than 50 reservoirs), agriculture (irrigation), tourism (various watersports and fishing). Several ecosystem improvement public programs are ongoing. In the 1980's sand and gravel extraction from the riverbed became a serious public concern.

Public participation to water management developed from 1992, with the creation of EPIDOR (a public agency set up between the 6 *départements*): a small team of hydrobiologists and water specialists built upon the initial concern about salmon spawning hampered by gravel extraction, and prepared and organised a public debate at the global level of the whole valley. The Dordogne Valley Summit gathered more than 150 participants representing the various water uses, who adopted a Valley Charter including 370 targets for water management; 32 targets were not adopted for lack of unanimity. This document became the basic reference for all future decisions concerning the river and its tributaries, thus allowing the coexistence of existing and competing uses. The Charter implementation has developed over a decade (1992-2004), and was subject to a review process and a general assembly in 2001-2002. The evaluation was positive, despite lack of progress on a significant proportion of the targets.

Other forms of water users participation were also developed under national impetus in the same decade: in 1994-1997, following the January 3, 1992 water act, a master plan (SDAGE) was prepared for Adour Garonne as for the 5 other French hydrographic districts, including a specific committee for the Dordogne, and results in official strategy for the district over the next 15 years.

From 1998 on, a more specific public debate process developed concerning water levels and flows, resulting both from the Charter and the SDAGE. There was growing discontent of the impact of brutal and icy water discharges by EdF, the hydroelectricity company, in the upstream portions. This led to a survey by independent social science teams of concerned water users, and to the recognition of the problem by the Electricity company and County councils. This issue is still negotiated in 2004, but some fishermen have decided to seek injunctive relief or damages in the courts.

Lastly, more local participation policies developed after 1997 on tributaries of the Dordogne, two of which are studied here: river contracts of the Cère and of the Céou should build a water users support to « light » public works to chiefly keep up the beds and banks and improve the ecosystem quality, but the second one turns out to produce more conflict than the other.

## Results

In the first process developed by EPIDOR, two IC Tools played a major role in the collective learning: on the one hand documentation was gathered and synthesised with maps; the diffusion of several thousand copies made a synthetic representation of the whole river and its problems accessible to a wider public, which is invited to attend the summit; the 2-day roundtable, set up on a stage in a public hall, got important media coverage (press, TV, radio...); on the other hand from 1994, a GIS-based Dordogne Observatory, offered a more permanent visualisation of water issues and public action to a motivated public; it gathered comprehensive knowledge of the basin beyond traditional bureaucratic sectorisation, and offered also knowledge on new themes like ecosystem management. This double action (on the media side and on the techno-scientific side) is deemed vital to impose a new representation of the Dordogne in public space, and the need for collective action to meet environmental issues.

When moving to the implementation and operations phase, participation structures are more local and aim at more specific targets. To study them, we have selected the 2 major issues at stake: impact of hydropower discharges on water quality and levels, and management of the aquatic environment.

There is indeed a general recognition of the river basin concept among the stakeholders, but to a much lesser extent with the wider public. More attention is devoted to the river itself and its needs, the needs of noble fish species, and of related categories of users like professional fishermen or environmental NGOs, until then overlooked.

These evolutions are related to 2 principal factors playing a determinant role in the public participation process of this case study:

- Political type factors. Process largely depends upon the positions adopted by elected representatives vis-à-vis new forms of democracy associated with public involvement. EPIDOR's success is due to the official support of the 6 *département* council presidents concerned with the river basin, who transfer their political legitimacy and temporarily waive the initial resistance of territorial government representatives (civil servants). River contracts also need an impulsion and a follow-up by local elected representatives. Success thus also depends upon their networking capacity in support of the processes. Concerning water levels and discharges, this same political factor leads EPIDOR to seek support at the corresponding level, i.e. with national Government solely able to influence energy policy choices of the national company.
- Cognitive type factors. Our research underlines the importance of information sharing between experts (be they civil servants or private, local or national), elected representatives and civil society. EPIDOR's success is the result of long lasting efforts in a collective production and diffusion of knowledge. Thus the control of water issues' representation tools (GIS, databanks) by watershed institutions appears as a determining factor, since collective learning is likened to the production of relevant information on the aquatic milieu, in which the stakeholders will have confidence.

In front of this change process, the main obstacles come from the existing government structure and the little room left to participation processes. Decisions may be taken, but implementation often remains controlled by pre-existing decision-making structures. Besides, there are problems of scale: on the one hand it is easier to settle on broad future visions at river basin scale than on precise actions involving traditional landownership rights at catchment scale; on the other hand, there is little chance for a local process to modify a national policy like hydroelectricity production. « Participation boredom » may result from lack of decisions follow-up and of information upon real influencing capacity of stakeholders. Better explanation of stakeholder participation limits within the institutional structure might alleviate the risk of trust undermining which threatens them.

# **1 Introduction and Approach**

## **1.1 Presentation**

The Dordogne river flows through south-west France, from the Massif central mountains to the Atlantic Ocean via the Gironde estuary, shared with the Garonne flowing from central Pyrenees. Stretching over 450 km the river is in a rather large watershed by French standards, where above one million people live. In contrast with other large French rivers like the Rhone and the Seine, it is usually considered as rather natural. Yet human occupation is very ancient, and has modified its settings; in the last century, the development of hydroelectricity radically altered its flow regime.

## **1.2 Public participation processes**

Public participation to water management was specifically developed at the beginning of the 1990s. This report concentrates on the achievements of the institution set up for this purpose at the whole basin level, and then covers more local PUBLIC PARTICIPATION processes in two cases of implementation and deepening of the basin-wide project. These three processes interestingly offer various profiles in terms of size, themes covered, and duration.

### **Dordogne Valley Summit and Charter**

This process covers both the entire river basin and all the activities and stakeholders potentially related to the river. It is probably the most ambitious French attempt at involving non-administration actors into integrated river management on the long run (more than 15 years, still ongoing).

### **« Water levels management » process**

The issue of water levels and hydroelectricity discharges (1991-2004) was covered during the 1992 « summit » among many others, but it is also raised during the elaboration of the SDAGE (master plan) of Adour-Garonne hydrographic district (1997), and later again (« participative diagnosis » within the preparation of EPIDOR's 10th birthday in 2000, « discharges challenge » in the 2004 revision of the water master plan). The scale is again the whole river stretch, but the collective issue remains limited to water levels (and temperature) variations, and to alarm procedures. EPIDOR acts as facilitator in a conflict between fishermen and the national electricity company.

### **River maintenance processes**

After 1997, stakeholders are gathered to develop environmental maintenance of some Dordogne tributaries (in particular Cère and Céou). These processes are fostered at national level under the label of « river contracts », which usually deal with smaller areas (between 500 and 2000 km<sup>2</sup>). They are still ongoing and offer contrasted examples of public participation and social learning.

## **1.3 Methodology**

Two complementary teams (LATTS-CNRS, and Cemagref's irrigation and teledetection units based in Montpellier) did the fieldwork. Issues covered dealt with institutional evolution of public participation processes, the aims and roles of various actors, influencing factors. Particular attention has been devoted to information and communication (IC) tools and their contribution to participation processes.

Investigation was developed in 3 steps: preparation (reading the press and documentation of web sites and books on the Dordogne, contacts with the EPIDOR and with researchers involved in other projects in the area); a second phase for field data gathering mainly in April 2004, through interviews, participative observation in meetings, review of local public and private archives; and pursued interaction with stakeholders in the case study writing phase (see annexes on the data).

## 2 Context

### 2.1 Socio-environmental framework

#### The Dordogne river basin

The Adour-Garonne hydrographic district is split into six major watersheds or sub-basins, and the Dordogne is one of them. With 24,000 km<sup>2</sup>, it covers 1/5 of the districts and is home for 1/6 of the district's population (1 million inh.). It is 475 km long, has a mean flow of 200 m<sup>3</sup>/s, but ranges from 30 to 1900 m<sup>3</sup>/s. Maximum width is 120 m, and the bed is subject to important changes during floods. There are altogether 500 tributaries and sub tributaries of length above 15 km, which add up to 5300 km.

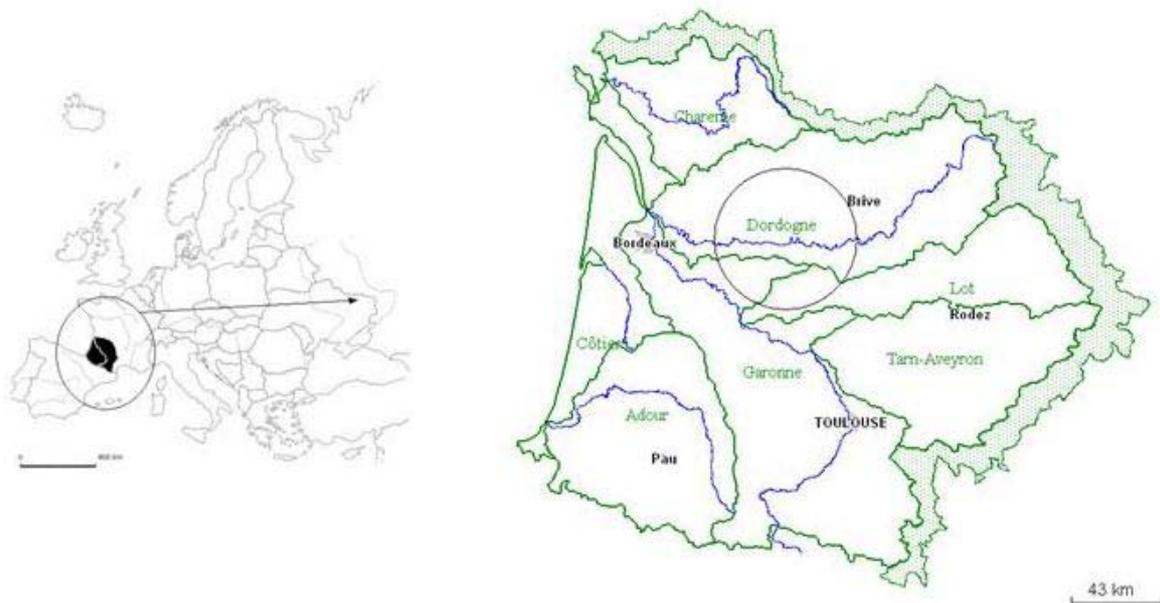


Figure 1: The Dordogne river basin in Europe

The basin is composed of 4 different geomorphology units: northern upper reaches are in the crystalline plateaux of southern Limousin, where torrential streams have created a hilly landscape with lakes and ponds; eastern reaches flow from crystalline and volcanic mountains of Massif Central, where rather heavy rainfall has furrowed deep narrow valleys; the central reaches cross the karstic area of limestone Causses, which is known as the 2 Perigord (black and white). Downstream reaches are in the molasses hills of the Aquitaine basin, and the Dordogne meanders through wider and more open valleys toward the Gironde estuary, shared with the Garonne.

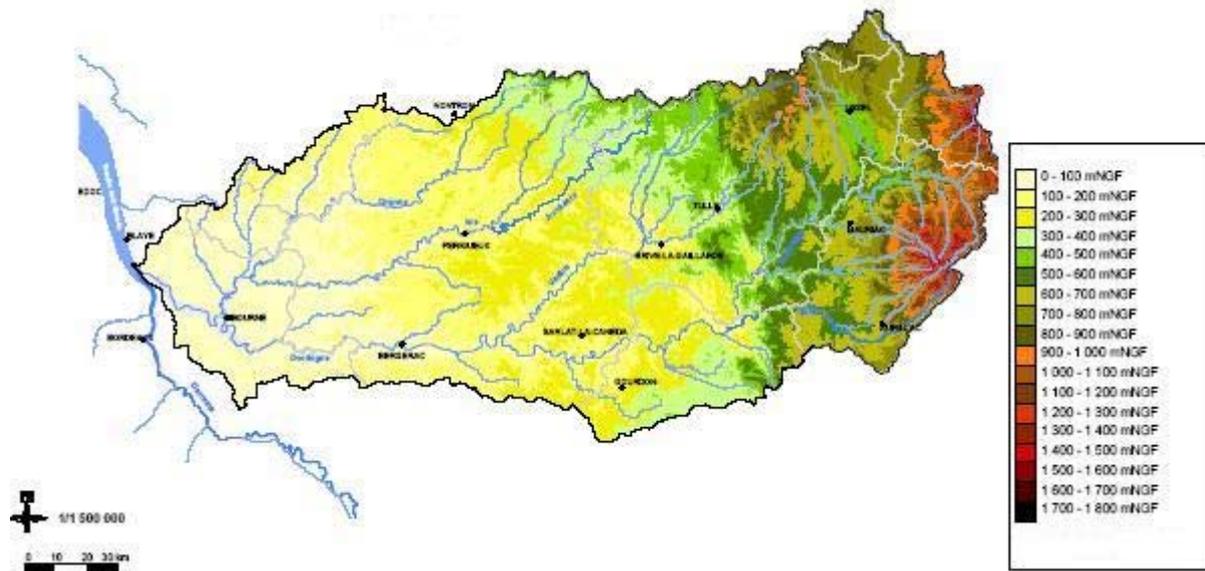


Figure 2: Geographical relief (source: EPIDOR)

### Water uses

Human activities linked to the river are quite numerous (almost 20 uses are quoted in past and present documents [Dordogne Valley Charter, 1992]). Some of these uses are also at the heart of the local economy, like agriculture and tourism, the two major employment providers in the area. So water related problems generally concern all the local communities, and are subject to crises requiring political intervention: e.g. in drought periods, to decide and implement water uses restrictions; or in case of floods (alarms, damage coverage), or to answer collective protests against heavy sand and gravel extraction, and increasingly against hydroelectricity water discharges.

In the past, the major water uses were navigation and milling, and now they include tourism, hydroelectricity, irrigation, and waste water evacuation.

Fluvial transportation has disappeared, except for tourism, which is not heavy. Agriculture (part of which is irrigated) is the economically and politically dominant activity in the valley, together with tourism. Farms are still often doing polyculture, with dominant cattle breeding and orchards upstream, and dominant cereals (corn) downstream. Irrigation of water demanding crops locally reduces and even quasi suppresses low flows on some tributaries, and increases the intensity and duration of drought crises. But it is the general situation in the hydrographic district, in particular for the Adour, upstream Garonne, the Lot, the Charente, and in the case study below on Céou).

Several dozen reservoirs, some of which quite large, were built for the purpose of hydroelectricity generation between 1920 and 1957. Altogether they can store 1 km<sup>3</sup>, one seventh of the French total hydroelectric, and 1/14th of the grand total large dams. They allow a production of 3.1 bn kWh (1990), quasi all controlled by the national electricity company, EdF (Electricité de France). Dordogne is important for EdF, since hydroelectricity produces only 20% of the total, but can be mobilised quasi-instantly to match upwards variations of electricity demands. This flexibility also allows a speculative use of water, with stocks made when supply is high, and discharges when demand is higher and electricity market prices are high. Discharges do have negative impacts on the aquatic environment, even though their exact nature is still in debate.

Tourism is the third and most recent water related activity. In rapid expansion for the last 20 years, it is characterised by the importance of water sports (more than 2000 canoes in the river in some

summer days, and a total number of 270,000 participants). Fishing also attracts a lot of people who are attached to the natural landscape (in particular some 5,000 yearly visits by fly-fishermen). The river landscape with its historical (and pre-historical) landmarks is also very attractive, including for foreign tourists, in particular English second homeowners. This tourist attraction also increases the pollution discharges in the rivers at the time of low flows; other discharges from industry and agriculture are minimal in contrast.

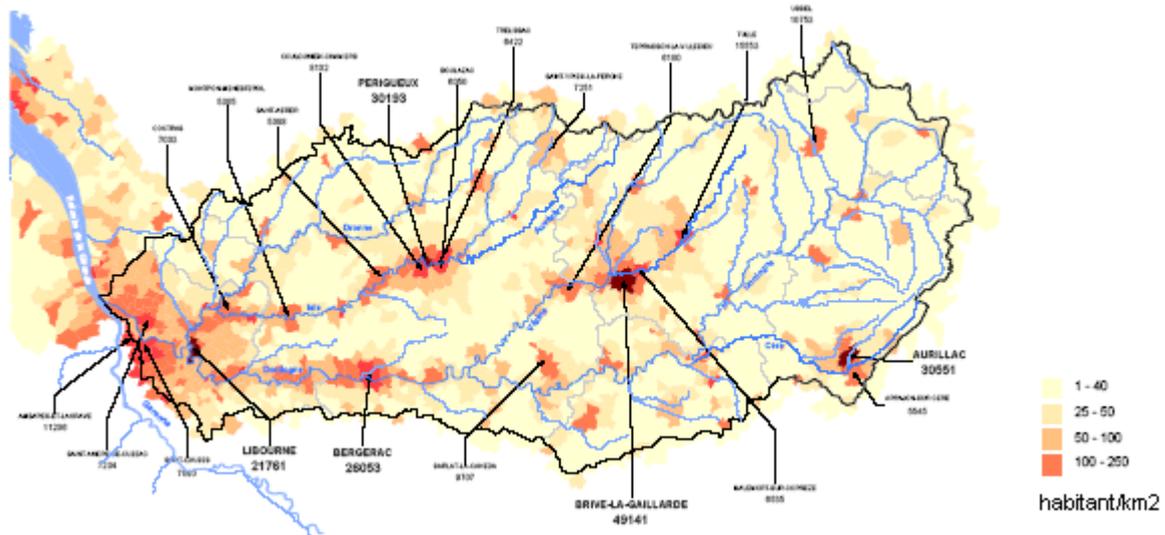


Figure 3: Population (source : EPIDOR)

Other river uses, once important, have disappeared or been marginalised today. It is the case with sand and gravel industry, which rose fast in the 1950s with the booming construction industry, and realised massive extractions in the bed of the Dordogne itself. But this practice was stopped by national regulations in the 1980s and the companies had to move to offstream sites in the alluvial plains. Navigation has been the major activity on the river during several centuries, and it was slowly replaced by rail transportation (Cocula-Vallières, 1981), and made almost impossible upstream after the development of hydroelectricity and water discharges. It is re-appearing now but only for tourism.

The protection of aquatic ecosystems is more recent and only constitutes a recognised « use » at the end of the 1980's; but it gets first order priority in the 1992 water law. Dordogne constitutes a rich aquatic environment, both for plants and animal biology [Natura 2000, web site: Dordogne]. Due to absence of large urban and industrial centres, the watershed keeps varied and relatively protected ecosystems. 44 species of fish can be found, including 8 major European (migratory) predators like salmon, shad (alose) and char (ombre), lamprey and even the rare sturgeon.

## 2.2 Institutional context in water management

### Legal status of the Dordogne

The Dordogne itself is part of the public domain: water flows and the bed belong to the State, and the banks are subject to State easements (towing path). Thus central government territorial services are in charge of granting licences, and they also charge a levy on riparian landowners for the sake of banks maintenance. EDF is granted hydroelectricity concessions for the use of public space, for 75 years, according to a Cahier des charges (conditions schedule), fixing the duties of the concession holder.

Some of these concessions come to an end in the decade after 2010, and renegotiations have already started. Water abstraction and sand and gravel extraction is also subjects to administrative licensing. Regulation enforcement (*police de l'eau*) is also left to these same territorial services of central government. Authorised activities thus benefit from a water use right which is protected by administration. Conversely, most Dordogne tributaries are not navigable and thus not part of public domain: their water flows are the common property of riparian landowners, who own the banks and half of the bed. Except when a river contract, or better, a SAGE (local integrated water management plan), provide specific rules, the prefect uses national framework regulations to settle water allocation disputes.

### **Water management institutions**

EPIDOR (*Etablissement Public Interdépartemental Dordogne*) is a territorial institution in charge of general interest actions concerning water and the basin. It was created in 1991 by the councils of the 6 *départements* crossed by the Dordogne (Puy de Dôme, Cantal, Corrèze, Lot, Dordogne and Gironde). Its valley development project aims at satisfying the needs of various water uses (in particular, agriculture and tourism), but also at keeping environmental quality and availability of water resources both in quantity and quality. Since 1991, EPIDOR organises co-ordination and consensus building between stakeholders, public communication (promoting a collective identity of the Dordogne valley), financing of specific studies, production and opening of a data bank. It focuses mainly on the improvement of water and aquatic ecosystem quality, return of migratory fish (salmon and sturgeon), riverbanks maintenance. EPIDOR is different from most of the other and more ancient EPTB (*Etablissements Publics Territoriaux de Bassin*, Basin territory agencies), who were in charge of managing a compromise between hydroelectricity and navigation, and thus own upstream reservoirs (Seine IIBRBS, Loire EPALA). Until now EPIDOR has remained a « *management neutral, participation activist* » according to its director.

The Adour-Garonne water agency is the management institution of one of the 6 hydrographic districts covering France. It operates under the legitimacy of its river-basin council, made up with approx. 100 representatives of local and territorial councillors, industrial water users, NGOs and government representatives. Adour-Garonne operates on 115,000 km<sup>2</sup> (1/5 of France) in the broad south-west, with a population of 6.4 million. Initially created to mutualise the financing needs to improve water resources quality and availability (5-year programs of subsidies and low interest loans financed by taxes on water abstractions and pollution discharges), it is also in charge of developing a master plan (SDAGE) since the 1992 law, and to support the making of catchment plans (SAGE) and river contracts. It does this in co-ordination with the regional services of the ministry of the Environment (DIREN), and is in charge of making and implementing the management plans created by the WFD. In 2003-04, it has prepared the requested inventory.

Several Geographic Committees allow for more local and better involvement of stakeholders in policies of the French Agences de l'eau, which usually comprise several distinct river basins with specific problems. One such committee covers the Dordogne watershed, and it is widely open to many stakeholders in the *départements* and *régions* concerned: more than 200 people are invited at each meeting (concerning WFD implementation, see <http://dec.eau-adour-garonne.fr/>).

### **Local authorities and territorial State services**

The Dordogne watershed partly or totally overlaps the territories of 5 *régions*, 11 *départements*, and 1500 *communes*. The latter have general police power concerning hygiene, public health and security, land use planning, water supply and wastewater collection and treatment, and non-domain rivers management. Because they are so small, many *département* councils develop support policies; they also have competence on water resources management, some supra local facilities, navigation and irrigation canals, wetlands, etc. Regions are usually less directly involved in water policy, with notable exceptions (Paris area, Provence...). This is also why EPIDOR was set up between the 6 chiefly concerned *départements*.

Central government relies on various services at *département* level to run water-related policies. The chief ones are the DDE (*direction départementale de l'équipement*) in charge of roads, public works, city water problems and national rivers; the DDAF (*dir. dép. de l'agriculture et de la forêt*), in charge of non national rivers and rural areas, irrigation and drainage; the DRIRE (*dir. Régionale de l'industrie et de la recherche*) in charge of industrial pollution discharges, and deep groundwater abstractions; the DDASS (*dir. dép. de l'action sanitaire et sociale*) in charge of drinking water quality, decentralised sewerage; the fishing sector is organised in federations at *département* level, controlled by the CSP (*conseil supérieur de la pêche*) at national level. They employ fish guards who have some police powers; lastly, environmental policies are followed at regional administrative level by the DIREN (*dir. rég. De l'environnement et de la nature*). Altogether, above 50 government services are involved on the sole Dordogne watercourse.

### **Co-ordination between public bodies**

Since the beginning of the 5th Republic in 1958, several attempts were made to develop a proper coordination mechanism between these many government services. In the 1960s, CTRE (*Comités techniques régionaux de l'eau*) were developed, and following the creation of the water agencies, river basin delegations and committees were created. Co-ordination by a « river basin prefect » was decided in the 1992 water law, as well as the co-ordination of water regulations enforcement at each *département* level (MISE). But as concerns a large river like Dordogne, the effects of these reforms has remained limited, since administrative territories do not match the watersheds.

EPIDOR is thus a novel and bottom up attempt to develop this co-ordination, since it starts in 1991 from elected bodies (counties), and then involves administrative services as well as civil society through the Dordogne Valley Charter process. After 1992, a top down water planning process is devolved by law to the 6 agences (the SDAGE or master plans), but since the Water agency relies on geographic committees, the SDAGE retains some decentralising spirit like EPIDOR.

However, various co-ordination attempts may end up in competition between institutions: it was the case when EPIDOR proposed to realise a SAGE (local catchment plan) for the whole Dordogne, which was refused: the environment ministry recommended instead that SAGE be made on the various tributaries of the river, so as to better correspond to the prefects' territories. Indeed, in the 1992 law, it is the prefect of the most concerned *département* who is in charge of setting up the CLE (local water committee) and co-ordinating its work. EPIDOR and the Water agency may also have tensed relationships, since both co-ordination attempts and resulting documents, have been developed separately with no explicit link (despite the SDAGE endorsed several targets of the Charter). The compositions of both committees were different, and EPIDOR relies on its own "local monitoring commission", which have no link with the Water agency. One must add that most other rivers in the hydrographic district have management institutions similar to EPIDOR, so that if they would each make their own project, the Water agency would end up with no real active role.

### **Public participation institutions**

Figure 4 below gives a synthetic vision of public participation approaches in water management with varied stakeholders, processes and IC tools. It illustrates two major differentiation criteria among the processes.

On the horizontal axis it is the more or less decentralised position of the public participation process leader, with the Water agency in a middle position between State and local authorities. On the vertical axis, it is the territorial scale where the public participation process is developed: whole watershed, intermediate catchment scale, *département*...

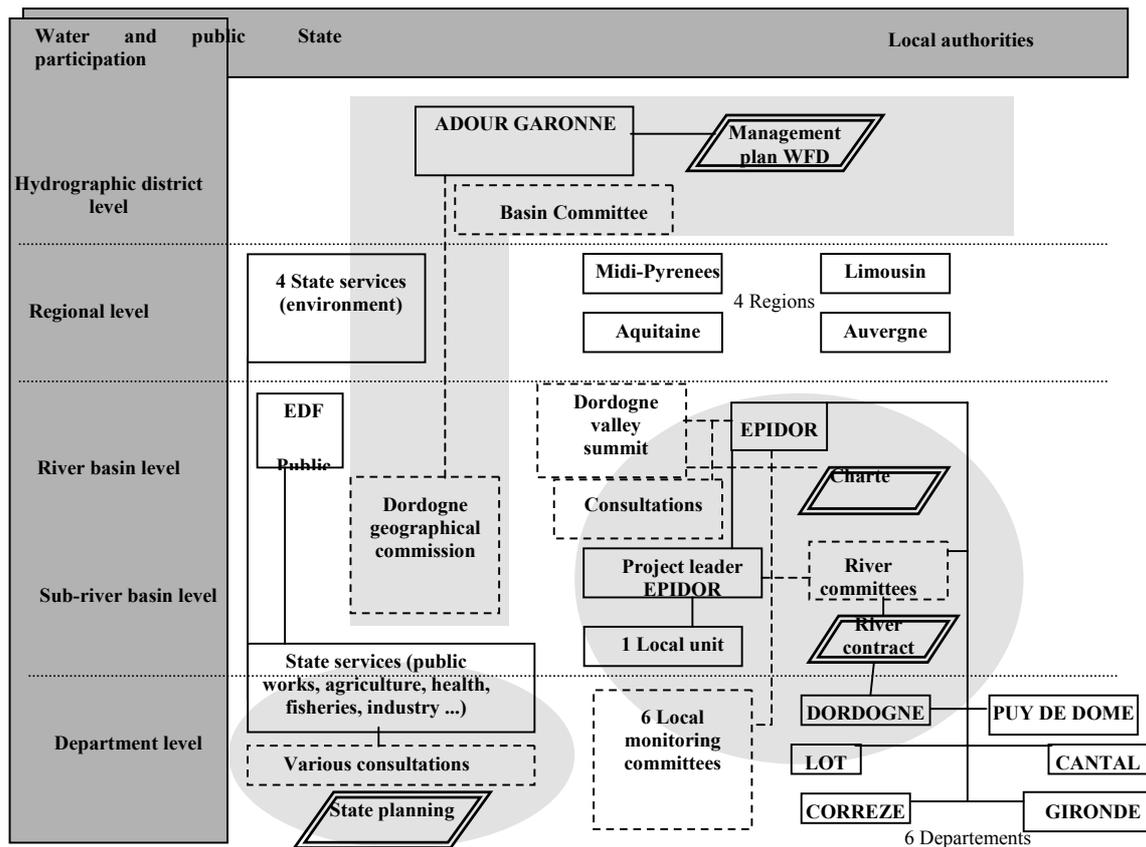


Figure 4: Water institutions

Three groups of public participation practices can then be identified through the grey shaded forms: the T-square up and left corresponds to action by the Water Agency, its river basin commission and the geographic sub committee for the Dordogne. It is focused on the master plan SDAGE, and now on the implementation of the WFD.

The round shape on the right corresponds to all consultation and participation experiments led by local authorities, their eventual joint boards, and chiefly by the *départements*. In the case of the Dordogne, there is a strong co-ordination by EPIDOR of all these procedures, from the 1992 Charter to the river contracts, including with the water levels issue.

Lastly, the oval shape bottom left groups the public participation processes which are mandatory for State services before deciding local public works or granting water use permits. Public inquiries have a long standing in France, but they have recently been widened with public debates or other forms of collective public implication, and they also may be adapted almost « in real time »: e.g. information exchange on reservoir discharges for security reasons, adaptation of the yearly “*réglement d’eau*” (water levels management) of some reservoirs in case of drought, more transparent decision making in the *départemental* committees led by the préfets.

## 2.3 Socio-economic and political context

### Socio-economic data

The Dordogne watershed is predominantly rural, with a few middle size towns: Brive is the largest and its urban area reaches 65,000 people; Périgueux (63,000), Tulle and Aurillac upstream (30,000

each), Libourne downstream (33,500) are the only other cities above 10,000. Population density is under national average, and slightly older in average. In absence of any systematic survey of their relationship to water, one can imagine that the rural type relationship dominates, in particular with the feeling that water is a production factor and there is a historical right of landowners to use it. A relatively small group of professional fishermen (200) survived (mostly in the lower part subject to tidal influence) and they voice their fear about the aquatic environment degradation, based on their intimate knowledge and their threatened professional interests. EPIDOR did rely on this group, as well as on the (weaker) environmental NGOs to push their innovative approach.

The watershed image is increasingly changed by the summer tourists' influx, which gives importance to the landscape and landmark dimension. Water and river perceptions are then modified from a production factor to a leisure, aesthetic, ecological and also fishing asset. Part of this non-indigenous population, richer and foreign, now stays all year round: they modify the socio-economic profile, and the demands on landscape/ecosystem quality. However they do not directly interfere with other active groups like fishermen.

### **Major conflicts and oppositions**

There are several historical phases in the evolution of water management in the area, each marked by the predominance of certain uses, with conflicts developing more recently. [See the table in annex].

Before the XXth century, anthropic pressure remained limited on rivers mainly used by navigation and traditional irrigation. In fact navigability has always been limited to the downstream and middle reaches, and Dordogne was placed in the navigable public domain only in 1861. But after the crisis of wine production (phylloxera pandemia), and the construction of railways, it slowly disappeared, and so there were no important public works susceptible of impacts on other uses.

In a second phase starting after the First World War, new uses developed with marked impacts on water flows and aquatic milieu. First use was hydroelectricity and the damming of the rivers, with the drowning of small villages considered as a « fatality »; after the Second World War, more dams were built and at the same time sand and gravel extraction boomed. Despite their important impacts on the watercourses and other uses, these activities were supported by a strong political and economic coalition, in particular since they paid taxes to otherwise poor communes and regions. Water exploitation was the best contribution of the area to the post-war national motto on urban and industrial economic growth. France had to recover its rank in the world despite the loss of colonies, and negative local consequences were largely accepted or hushed up: protests remained marginal and localised around dam sites. Yet tourism started booming and producing local revenues in the 1960s

A third phase opened up in the 1970s with the birth of a structured opposition to the dominant coalition. Water pollution from cities and industry was placed on the national agenda, and the Water agencies now operated a taxing and funding mechanism. Taking advantage of an important landscape and environmental protection mobilisations, in particular on the river Lot, which is adjacent to the Dordogne watershed, the government initiated « clean river » operations, and the Dordogne was chosen as one of them.

This pollution control policy met several local movements, which can be rapidly grouped in 3 types:

1. Back in 1965, several *départements* had started to reflect upon possible tourist development in the valley, as a possible alternative or complement to the sole agriculture; advertising programs needed to rely on good environmental quality.
2. In the 1970's, local protest grew against gravel extraction and its impact on water and landscape, and extractions control was scheduled within the rehabilitation program "*Dordogne rivière propre*" ("Clean river"; 1977-1980), which already tried to adopt an integrative approach.

3. At local as at national level, the environmental protection movement rose and fought for the return of extinct natural species due to earlier dams construction; the return of salmon in particular attracts a large consensus.

These social movements were now inter-related with public actors, and they managed to focus their attention on the watercourse identity. They undermined the previously dominant coalition, and publicised problems with river exploitation activities and the related contradictions: irrigation and tourist pollution vs swimming and canoeing, water discharges and gravel extraction vs fishing etc. To summarise, there was now a new advocacy coalition (Sabatier, 1993) fighting against the dominant one based on economic anti-environmental nature's exploitation, and promoting economics development based on environmental assets.

This new coalition adopted a quite new policy making process, i.e. through collective learning and mutual co-operation between various actors rather than on either enforcement of legal rules or direct implication in various facilities construction or operation (e.g. dams, sewage treatment plants). Typically, it managed to set up a lightweight institution, EPIDOR, which gathers information from all actors, even if controversial, to obtain publicised commitments to water friendly investments or operations by others.

Because the institution is lightweight, it tends to base its legitimacy on issues which are not covered by other actors, and typically on integrated and participative water management. For instance, one of its first studies was on public wastewater collection and treatment systems, which are often as numerous as deficient in rural areas and small towns. But, partly because they cannot undermine the legitimacy of elected representatives of the *départements* who support them, they do not get involved in related potential conflicts, all the more so since they are quite technical and specialised issues, not easy to grasp by the public, and they are covered by the more powerful Water agency. Yet later, the issue of a more direct involvement of EPIDOR in infrastructure control and even operation will be raised as a solution for a risk of declining legitimacy. When the bicycle does not run, it falls.

### 3 Description of the public participation process

Several public participation programs have been implemented in the Dordogne river basin during the 90s. They present different features, which vary depending on the scale and the period of time considered. Our research documents three of these processes, from their early stages to the current period :

- the first program is launched in 1991 and implemented from 1992 onward (via the “Dordogne Valley Charter”); it covers the whole river basin and aims at addressing all water issues altogether
- the second program deals more specifically with water level management and the impact of water releases from hydroelectricity dams (first steps in 1991, full development from 1997 and after). (see figure 5 below)
- the third type of program focuses on the management of watercourses (in 1995 for the Cère, 1997 for the Céou, two tributaries of the Dordogne : see also figure 5).

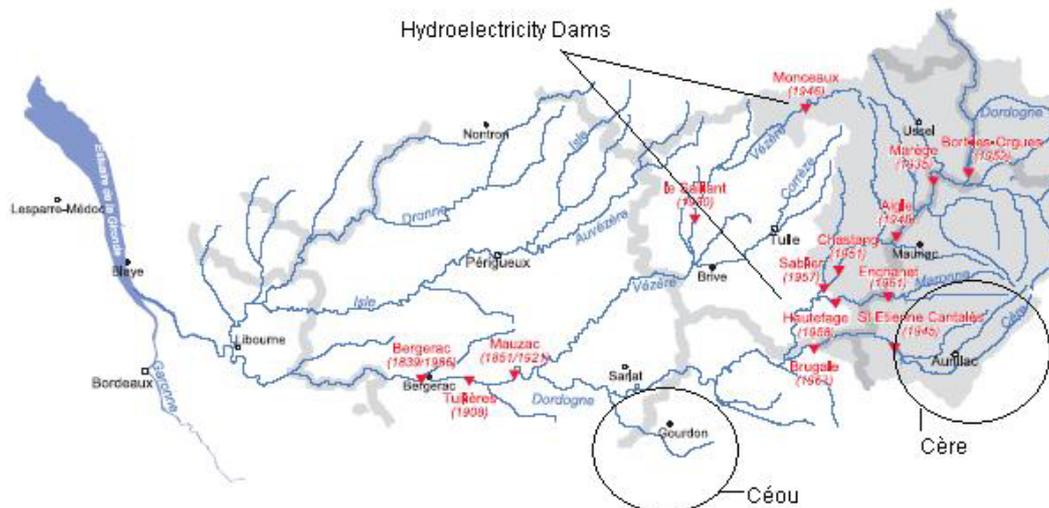


Figure 5: Cere, Ceou and dams localizations (source : EPIDOR; adapted)

In all these cases, an historical inquiry (documenting origins and first steps of programs) and direct observations (for ongoing processes) have been conducted. The same analytical grid has been applied in each case, for comparison purposes (see point 4, “Analysis”).

The following table illustrates the three processes and their chronological development (grey tones indicate the degree of implementation)

Table 1: Public participation process

Processus	Taille	1991 – 1992	1992-1994	1995-1996	1997-2000	2001-
Dordogne valley Summit and Charter	Dordogne river basin (24.000km <sup>2</sup> )					
Water level management	Dordogne (400 km)					
River contract 1	Tributary : Cère ( 1054 km <sup>2</sup> )					
River contract 2	Tributary : Céou (610 km <sup>2</sup> )					

No process	Start	Development	Implementation

### 3.1 “Summit and charter of the Dordogne Valley” process

#### Objectives, activities and phases

The Dordogne valley public participation process was initiated by a coalition bringing together the main local authorities in the Dordogne river basin (“Conseils généraux”). They set up in 1991 a joint board (EPIDOR, for “Dordogne Interdepartemental public body”) which aims to manage common water issues. Doing this, the authorities also carried on the efforts of local civil society movements, which had been promoting environmental values since the 70s. At the end of the 80s, this network of associations, professional actors and scientists (see below) gained in political clout: the electoral scores of ecological parties in France, but also in Europe, made the environmental question politically attractive; elected representatives give more attention to the issue and more public support to the social networks which defend environmental ideas.

The first and main objective of EPIDOR is to promote a wide recognition of one of these ideas: the need for large, comprehensive public action on the river, which must be managed as an ecosystem, at the river-basin scale (rather than fighting only against point-source pollutions). The idea of integrated water management remains confidential at this time, due to the lack of interest from State or local authorities. Consequently, the goal is to legitimate and to contribute to a new form of public intervention in water management.

As far as public participation is concerned, three phases can be identified (from 1991 to now), which correspond to three forms of stakeholder involvement:

- From Spring 1991 to December 1991: a **preparatory phase** (during approximately 8 months) aims at building up a shared vision of problems and solutions concerning the Dordogne river basin. The EPIDOR staff prepares a draft document, in collaboration with many stakeholders and public services (state and local authorities). The document is then submitted to state services for commentaries (with the agreement of the ministerial hierarchy) and others water users and authorities (on the whole river-basin, which totalise hundreds of stakeholders). Questionnaires help to gather suggestions, remarks, or changes proposed by participants. Some water users (boatmen, fish-farmers, environmental associations) receive special support to contribute to the process, mainly through technical assistance from EPIDOR staff. All propositions are gathered together in a new document (212 pages) which enumerates the problems and the solutions proposed (with mention of the source - organisation and/or person). It is widely distributed (around 3000 copies) in order to give the same information basis to all participants and create a shared vision of the existing problems and possible solutions. At the end of the day, 402 “consensus” are listed in the document, which presents the main options of river management.
- From 31 January to 2 February 1992, the “Dordogne Valley Summit” (or “Bergerac Summit”, from the city where it took place), opens a **deliberative phase**, where the solutions (the “402 consensus”) are discussed and officially adopted - but only when they are unanimously approved.

Fewer stakeholders are involved here than in the first phase : 51 “negotiators” are co-opted by 17 stakeholders groups, including state services, consumers and environmental associations, fishermen (professional and amateurs), water companies, riparian owners, etc. Each negotiator represents the interests of his or her group for the whole river-basin. The general public (the citizens) is not represented as such, even if the elected representatives usually speak in its name.

The public participation process is guided by the research of the agreement and the avoidance of conflicts and oppositions. Some techniques used are explicitly oriented towards this goal : first, stakeholders negotiate at a large round table, which aims at levelling the difference of status between them (for example, the negotiators representing the state or the fishermen are equals in this arena); the localization of participants is knowingly set up so as to avoid direct conflicts between known opponents; a special host (nicknamed “*le candide*” i.e. “the Innocent”) helps the discussion to begin (with naïve questions and points of view) when it is blocked by deeply rooted oppositions and conventional arguments. The professional host, who leads the debate, is voluntarily foreign to the region and the issues at stake (he is actually from the French-speaking Canadian province of Quebec). Rules of discussion and vote are applied: time is limited (2 minutes by participant); the discourse must stay focused on the “consensus” discussed (from the synthesis report), i.e. a river management option, and not on the positions of others actors; there must be unanimity for each agreement (each participant has a right of veto)

The participants are also prompted to play the game and reach consensus through others levers, which put them under pressure : the general public follows the negotiation process (which takes place in a large auditorium, the round table being on the stage); many journalists have been invited to give accounts of the process; in addition, it is recorded for TV and radio, some excerpts are broadcasted, and all the debates are archived; the main elected representatives (the six presidents of “*Conseils généraux*”) in the river-basin are present as well, on a platform behind and above the round table; finally, the debates last two days during which the participants are engaged in an almost “non-stop” discussion (for a total of 15 hours). All these elements contribute to create a temporary group dynamic, which encourages the participants to take part in the collective action and its success.

With the help of these techniques, 360 agreements are eventually voted (to compare with the 402 initial propositions). The complete list is presented in a specific document (the “charter of the Dordogne Valley”), signed by each negotiator.

- February 1992- now: finally, the **implementation** of the “charter” includes other types of public participation. Six “local monitoring committees” gather various stakeholders, state and local authority representatives to control the implementation of the “Charter” and its specific agreements. A “Dordogne observatory” is set up in 1994 to produce and disseminate information on the river and help the committees in their task. In 2001, EPIDOR and other public bodies organise a large assessment of the water policies and the implementation of the charter (based on specific studies), whose results are discussed during a public meeting: the “General Convention of the Dordogne” (*Les Etats généraux de la Dordogne*) [see EPIDOR, 2002]

### **Information and communication tools (ICT)**

Three types of ICT support public participation during the process :

- Traditional techniques of documentation are used during the first two phases to disseminate the information widely in the groups of stakeholders. Questionnaires or lists of remarks and demands (for the Bergerac Summit) help to extract and gather information from a large range of actors, in spite of their differences, diverging point of views and cultural references, etc; at the same time, the synthesis reports put into circulation thousands copies of the river basin management vision, disseminating facts and data on which this approach is grounded. More specifically, during the Summit, audiovisual techniques allow to strongly link the negotiation arena to the outside world and the public sphere. TV cameras and the press, the recording of everyone's acts and speeches install a public space (temporarily) in which each participant must position themselves.
- During the implementation phase, a GIS (Geographic information system) and an internet site (part of the Dordogne Observatory project), aims at collecting, treating and circulating information on the state of the river. These tools allow EPIDOR to gather and organise data from different public and private sources, and to make them accessible to stakeholders (however the communes and their joint boards are the main users).
- Other tools are also used in the implementation phase to promote the identity of the Dordogne as a natural entity (logo, leaflets, newsletters, posters, etc). The logo is based on a local legend, a dragon which is supposed to have lived in the river. A two-meter long resin sculpture, is also used to show to the public one of the most extraordinary fish living in the Dordogne (nicknamed “Léon the Sturgeon”). In general, these tools aim at nurturing a feeling of belonging; the main goal is to strengthen the relationship between the Dordogne river (and its species) and the people living there, who are encouraged to see it as a common property.

### **Results**

During the period (1991-2003) positive evolutions have occurred as regards the aquatic environment and problems related to water. The growing number of salmon in the Dordogne (objectively measured) offers a strong symbol of this transformation. In 2001, the assessment of the “Charter of Dordogne Valley” implementation also emphasizes the progress which has been made, even if many of the results are only partial or fragmentary.

Such an assessment is, however, difficult to make, as initial agreements (in the “Charter”) lack precision (Moquay, 2003), and cannot be directly linked to the public participation process conducted by EPIDOR . (other public programs were implemented on the same period, such as the national “Salmon restoration Program (*Plan Saumon*), the European LIFE program, etc. Moreover, stakeholders still disagree on the real nature of the results: fishermen and environmental associations criticize the process for being too slow, while farmers' unions claim that the 2001 assessment lacks objectivity [EPIDOR, 2002: 54]

What is certain however, is that the process had an impact on the local governance structure and policies on the river. The public participation process encouraged the aggregation of several groups and actors defending a new approach of water issues [see Figure 6,]: professional interests, grassroots

organisations, political actors (local and national-ministerial level), administrative experts, scientists, public funding agencies (and among them, the Adour-Garonne Water-agency).

EPIDOR benefits from this conjunction of interests, which forms the foundation of its credibility; its competence on water issues cannot be seriously contested after the Dordogne Summit; its legitimacy to speak in the name of the river increases in proportion. This configuration remains stable, as the institution representatives try to keep a certain neutrality in the local conflict over water (even if EPIDOR is still considered as “close to the ecologists” by some users). The public body also develops its own resources: collaborations between its staff and the local actors in the basin, creating a network of support and information sources; a knowledge basis which makes it itself a source of reference on the “natural” Dordogne (GIS and Dordogne Observatory). When conflicts occur, EPIDOR may take advantage of its neutrality and help to create a common frame of reference for opponents (by validating figures or facts; as it did, for example, in 2001, when boatmen accused EDF (unduly) of being responsible for a sudden rise of the water level)

The transformation of the governance structure also enables a better integration of environmental dimensions in the public policies (which do not take into account this aspect until then (1991), due to the lack of interest of the state- as owner of the river - and its specialised administrations for global, environmental issues). The creation of EPIDOR introduces a new vision of the river into the public space, in parallel with the traditional administrative perception of the river; the Dordogne becomes an environmental entity which must be protected for its own sake, even if the nature of the protection remains a matter of discussion.

However, the structural change is also limited and leads to tensions, which are perceptible right from the first years of the “Dordogne Valley Charter”. Firstly, they appear between the river institution and the state services, which refuse in 1993 to let EPIDOR leads a new, more powerful water management procedure (the SAGE, a water planning tool); administrations also choose to ignore the Summit agreements, for example in 1993, by giving authorizations for deep bore holes in areas where it is forbidden by the “charter”. At last, drought management remains under the responsibility of the State representative (the Prefect), who negotiate water restrictions directly with the farmers in some areas, without referring to or taking into account the “charter”. The working relationships between the Water Agency and EPIDOR is also characterized by tensions, as they are collaborating as well as competing for the orientation of water policies in the Dordogne Basin. The current discussions around the assessment of water bodies (in relation with the WFD) illustrate this point, EPIDOR defending its own vision, which is partly different from the views of the Water agency.

### **3.2 « Water level management » process**

In the beginning of the 90s, the water level issue becomes a central concern in the Dordogne river basin. Other users are more and more disturbed by the irregular hydrologic regime caused by the dams: fishermen, water sports and tourist activities, environmental associations. At the same time, the upgrade of some dams tends also to make the situation worse.

#### **Objectives, activities and phases**

From the outset, the water levels issue is one of the concerns of the EPIDOR institution. Several public participation process are organised (from 1990 until now) to solve the problem by setting up a negotiation between the main actors concerned: the national power company managing the dams (EDF) and the users protesting against the water releases (mainly the fishermen and the environmental associations). The public participation process is also an alternative to lawsuits, which are started by some users against EDF (some are still ongoing today).

The main phases of the process are as follows:

- 1991-1997: the water level / water release issue are tackled during the main public participation processes started on the Dordogne : the “Dordogne Valley Summit“ (1992) and the Adour-Garonne SDAGE (1994-1997). Both urged to open a negotiation between EDF and the other users in order to reduce the impact of water releases. However no common agreement on water level management is signed during the next years, due to the lack of interest of main actors (EDF, public bodies)
- 1997-2000 : following the SDAGE process, a working group is set up, getting together EPIDOR, State services (Environment regional services, *DIREN*, and sometimes Industry services, *DRIRE*, monitoring the dams), elected representatives (County level, *Conseil general*), fishermen (Local associations and National fishing service, *Conseil supérieur de la Pêche*) and EDF. The group meets from one to three times a year. In 1999, the most combative fishermen association (TOS, for *Truite-ombre-saumon*) becomes a member of the group. The association started several lawsuits against EDF the preceding year; although unsuccessful, the litigations damaged the public image of the power utility company. After a short bilateral negotiation, the opponents decided in 1999 to enter into a collaboration: TOS dropped its lawsuits and began to participate actively to the working group; EDF committed itself to take into account their concerns and seek solutions.

Spurred on by EPIDOR, the working group commissioned several studies on the hydrological aspects (water levels and environmental impacts), as well as the sociological dimension of the process (users' perceptions of the water releases and their consequences). In both cases, during the fieldwork, the researchers sought close interactions with the local populations and the lay experts from the associations. The consultants (with an hydrological and hydrobiological specialisation) took advice from the TOS members, benefiting for their knowledge of the fish reproduction and the river; the sociological inquiry is conducted by a trained anthropologist, who is attentive to the local point of view and concerns (70 in-depth interviews were made, some pivotal actors contacted several times and 4 public meeting organised on water release issues, with more than 140 participants)

The studies are delivered between 1999 and 2001. They offer many insights of the issue at stake and propose solutions which have been elaborated and validated by the users: a better and quicker dissemination of information about water releases; changes in the management of dams in order to protect the aquatic environment and species. The studies also install a cognitive frame which enables concrete negotiation.

- From 2000 to now: in this third phase, the public participation process is brought to a halt, which leads some stakeholders to question its rationale. The main obstacle concerns the implementation of the recommendations formulated at the end of the second phase. As regards informing the water users, some progress is made, as more information is given on water releases; but EDF and the state services are still reluctant to make public the water releases without delay (EDF arguing about industrial confidentiality and the State defending the status quo in its water level measurement system). Furthermore, if the dams are to be managed differently, it results in loss of earnings for EDF, which demands to be compensated for this (which others users reject). The working group try to get a national (ministerial) decision on this point but unsuccessfully. The public participation process is therefore stopped which increases discontent; in 2003, stakeholders (professional fishermen) start a new lawsuit against EDF. More recently, the Water Agency and EPIDOR reactivate the water level management process, (with a new name “The water releases challenge” *le “Défi éclusées”*); new studies are commissioned to find how water release can be technically changed, and for which cost. The state services play an important part in this process, as some hydraulic concessions (see above) must be reallocated.

### **Information and communication tools**

During the central phase of the public participation process (1999-2000), two types of tools played a pivotal role; they contributed to modify the participants' vision on the water releases issue:

- Maps illustrating the impacts of water releases, as perceived by the water users (elaborated by the anthropologist: see Faure, 2000). These maps prove that a shared representation of water release exists, all along the river. They objectify the collective representations about the river and prompt stakeholders, including water managers, to take into account the social dimension of the issue - not only the technical one. More concretely they contribute to the awareness of EdF executives, realizing the social impacts of their dams.
- Graphs showing the flow/time relationship curve (elaborated by consultants). The graphs make the knowledge on flows accessible for all and they attest the change in the hydrological regime. They give a precise, striking description of the phenomenon, which remained ill-defined and contested by some actors until then.
- EdF also develops tools which aim to communicate its vision about water management. The company display such tools in one of its sites of production: a 3D model of a hydroelectric dam; a 2,5D chart localizing dams on the Dordogne. These communication tools offer a public image of EdF, which emphasize the rational dimension of dam and water release management.

## Results

The consequences of the public participation process are twofold (in 2004).

- Some results can be considered as positive without doubt, as the production of two protocols related to the diffusion of information on water releases, and the management of one dam (La Maronne). In the first case, an internet site publicizes the information made available by EdF and state services (the access was restricted beforehand). In the second case, EdF accepts to increase the flow downstream for one of its dam and to take into account, as much as possible, the demand of species inhabiting the river. Doing this, the power utility company moves towards the recognition of other interests than energy production. More concretely for the environment, this evolution brings more water to the river and helps to improve the protection and the development of threatened species.

In both cases, the studies have a less visible yet crucial effect. They give to the stakeholders a common frame of discussion: new solutions, such as information systems, appear as the result of collective agreements (Faure, 2000); common integrated management indicators are defined and accepted (flow level, in m<sup>3</sup>/sec, downstream of specific dams). Both offer a basis for negotiations between stakeholders, who may then discuss tangible, substantive issues.

Since 1999, the exchanges in the working group also enable some of the participants to better understand the views of the others. The EdF executives have gained a better knowledge of the ecological dimension of the water management, which was foreign to their professional culture until then. In parallel, the environmental activists and the fishermen become more aware of the requirements of hydroelectricity production, as a part of the national energy policy; more generally, they also became more familiar with the EdF technical (some said “technocratic”) culture. They learn to adapt their requirements to the ongoing negotiation and to reformulate their demands to match what it is possible to obtain at a certain phase of the process (for example, they accepted to “sacrifice” a few natural areas to get a better protection of the aquatic environment as a whole).

- Other results are more negative in nature: they arise from the failure of the public participation efforts and the identification of the obstacles which hinder the learning process. Throughout a decade of debates on water releases issues, the stakeholders realize progressively what belongs to local or national decision-making; they also evaluate more precisely the size of the different actors and their resources. EdF policies for the Dordogne are strongly linked to national or European strategies, with stakes of the same nature; while the interventions and interests of other participants remain defined at a local scale. Knowing that, local actors (such as EPIDOR) begin to react appropriately, by attempting to mobilise support at the national level (members of the parliament, ministries).

### 3.3 River Contract Cère

The river Cère is an upstream tributary of the Dordogne. It is 119 km long and drains a mostly rural river basin (1054 km<sup>2</sup>). 66 communes and 70.000 inhabitants are concerned (with 29.000 potential visitors during summer). The economic role of the tourist sector is increasing and tends to counterbalance the declining agricultural production. Before 1995 river management was non-existent, apart from limited public works on the river banks. As for many others “non-domanial” rivers (whose banks and bed are privately owned) riparians neglect to upkeep their property (banks or weirs)

#### Objectives, activities and phases

The public participation process is strongly linked with river maintenance programs (“river contract procedures”) whose objective is to promote local economic development in relation to the river. Previous water planning procedures had already recommended actions in this specific area (Dordogne valley summit and SDAGE). The main substantial objectives of river contracts are improving and monitoring water quality; developing the management of water supply and preserve the aquatic environment; promoting tourist activities; fighting to curb pollution, especially eutrophication.

Two types of actors played a leading role to launch the process and develop it (1995-2000). First, EPIDOR attempted through the river contract to act locally and carry on the implementation of its “Charter” (2 other “river contracts” were started on the river basin).

The institution was represented by a project leader, who fulfilled many tasks: she coordinated the numerous actors concerned; produced and accumulated knowledge on the Cère basin (technical preliminary studies); led the participatory management process.

Secondly a local politician (Mayor of Vic-sur-Cère, Cantal) was highly committed to the process (he would later become the President of the “River committee”, the deliberative assembly associated with the contract). A writer, keen on rivers, the Mayor was also an amateur fisherman and his commune was historically one of the first tourist site in the region.

The public participation process cannot be split up into phases, in this case, since continuous efforts were made to involve the stakeholders, after the river contract was signed. Main actions were carried out by the project leader, who strove to associate local councillors, mayors, members of the local community. She also built up an inventory of the weirs, on the Cère and a cartography of ecological habitats. The database was computerized and regularly updated. It was used by local councillors, water managers and users who can get information on the Cère and identify the major issues. The project leader spent most of her time doing fieldwork and meeting people to build up the database, which strengthened her relationships with the local community. Similarly, the President of the “River committee” attempted to convince his colleague – the other elected representative - to participate, without excluding anyone for political reasons.

Stakeholders were more or less responsive to these attempts to promote a collective action. But generally speaking the participation remained weak, except from elected representatives.

- The water agency was an important contributor to the river contract at first, through a specific subsidy allowed to the related operations. However, the measure subsequently came to an end, which discouraged new participants from join the program.
- The “Chamber of Agriculture” (*Département du Cantal*) was more directly involved and sent a newsletter to farmers (though only a couple of issues were published). But its influence was limited and farmers did not really change their ways or even accept to be more involved in the actions against eutrophication. Overall, they did not seem to have become more aware of the pollution caused by their activities.

- Similarly, industries remained distant from the process. Only a few factories applied for and received subsidies from the river contract. EDF provided funding for specific action (creation of artificial spawning sites) to help local associations of fishermen; but the public corporation and its employees were not involved locally. The tourist sector was the most active and the best represented, benefiting from the support of a local councillor, who acted a spokesman of their interests.
- Most of the riparian owners were not interested either in the river contract process. Only 10 weirs are considered as having priority (among 184) whose owners were directly and financially encouraged to participate to the contract; the others owners of weirs only received an informative leaflet. They were consequently not much concerned with the process and did not support the public action. In the same way, small hydroelectricity producers kept their distance from the contract process. They defined themselves as private owners and they appeared above all anxious to protect their status and water rights.

### **Information and communication tools**

IC tools are used to mobilise local actors and to build up a shared vision of the river.

- Between May 1995 and 1997, a GIS is linked with the Cère Data base, and used in combination with a slide-show, illustrating the different landscapes along the river. In 1997-2000, a “Cère cartographic atlas” assembles key-map, analysis and commentaries (September 2000, made by EPIDOR). Both tools support the river contract, in its starting phase as well as in its development.
- More specifically, a presentation with images of floods in the Cère river basin serves to show the utility of flood mapping actions and floodplain regulations.

### **Results**

Stakeholders disagreed on the meaning of the public participation process and the nature of its consequences.

On the one hand, the local councillors, the technical staff of local authorities and some stakeholders (fishermen unions or federations) consider that they have been successful in organizing exchanges between participants, which led to real decisions, even if the results were not completely satisfactory. 10 weirs have been rebuilt, with direct positive effects on river bank stability (even if the others remain unchanged and not sufficiently maintained); a number of wastewater treatment plants have been built or upgraded (although, without tangible consequences on water quality, which shows persistent problems of phosphate pollution due to the farmers’ practices)

On the other hand, some stakeholders think differently (individual fishermen, environmental associations, riparian owners). Based on the direct observation of the river, their judgement is more critical. They remark that few operations have been carried out, and that among them, a good part would have been conducted anyway, with or without the contract (to match legal standards). The river quality didn’t improve perceptibly; the “political” aspects were more important than the technical ones in selecting the actions, whose visibility (in electoral terms) was a key element. They claim that some operations with good potential results, but with less visibility, have been discarded.

As far as IC-Tools are concerned, the case illustrates the fact that such instruments may have other functions in addition with their traditional uses (as information treatment and presentation tools). By doing fieldwork, the project leader also builds up a network of local mayors, elected representatives, and water users (or at least some of them); doing this, she gains a better knowledge both of the ecosystem and of the local community. In general the collaboration around the database increases trust between local authorities and the river basin institution, personified by the project leader. In parallel, the sheer existence of the data base also increases the credibility of the public program. The GIS is perceived by local actors as a high-tech tool and the sign that the river deserves attention; the

public investment in technology calls for more public and private efforts to protect and manage the environment.

### 3.4 The Céou river contract

Conversely to the Cère case, this process developed in a more conflicting situation, and the classical mobilisation process by EPIDOR met more resistance. The institution indeed tried to make the general objectives of the Bergerac summit more concrete, and to organise local stakeholders in the building of an identity of the river and of its heritage enhancement. But the contract's preparation did not succeed in ending the conflicts, up to the point where one riparian landowner started a case in the administrative court against the contract (which is still quite unusual in France).

The Céou is a small tributary of the Dordogne, with a 610 km<sup>2</sup> wide catchment; almost  $\frac{3}{4}$  of this territory is in the Lot *département*, and only the downstream part is in the Dordogne *département*. Average rainfall is above 900 mm, but a good deal falls during summer storms, i.e. is quite irregular; besides, part of the catchment is in a karstic area, which implies that part of the stream disappears in the summer; some hydrologists hypothesise that under a certain flow, the water indeed flows underground towards the Lot, and only in the Céou mainstream above a certain level. The drying out period seems longer now than in the past, and this is probably due to irrigation abstractions. The Céou flows into the Dordogne just in front of the headquarters of EPIDOR, in Castelnau-la-Chapelle.

Around 55% of the land is woods or moors or unused for agriculture, vs 40% used by farming (with larger share downstream) in the Céou's alluvial plain. Corn and tobacco do need additional irrigation.

The drinking water demand (including its doubling in the summer due to tourists, and to animal watering), is met with deeper groundwater or interconnections with other utilities, and thus does not conflict with the other uses. Conversely, of the 41 more or less ancient mills in the catchment, 5 are equipped with micro-turbines and incur electricity production losses in low flow periods. Lastly, water sports are important, with amateur fishing, and canoeing (more sports in spring, more leisure in summer). Low flows sometimes makes life difficult for fish, which find it hard to go beyond the weirs of the mills. Moreover, the tourists like to stop on the banks to rest or picnic, but the Céou is not navigable, and riparian landowners fight for their property and tranquillity rights. As in many other places in France, there was a projected upstream reservoir to support low flows, but it was not built for lack of sufficient economic interest.

In this context, EPIDOR tried to develop an interaction between stakeholders to support the river landscape and visibility enhancement. One idea was to create in selected places landscape observation points with geographic comments; another idea was to fund, though only if mill owners agreed, the creation of fish passes in the weirs to help migrators swim upstream; in one location, light works would facilitate the descent of canoes in the spring races ...

But these small projects were not supported by all, and in particular by some of the mill owners, who were already upset by the development of tourism in the summer, and who feared that the river contract would just help water sports to develop even more and to invade their private property. One of them in particular, who owned the first mill upstream the Céou from the merger with the Dordogne, within Castelnau-la-Chapelle, was convinced that EPIDOR "has sided along with the mayor" of the commune, because they have their headquarters in the city, and the mayor has a canoeing business. He thought that the observation standpoints are the first step towards a systematic footpath along the banks breaching property rights. For him, fish upstream migration and survival did not need any works, but just a reduction of abstraction rights taken by farmers. Lastly, he thought that flood risks should be much higher up the contract's agenda: he kept photographs of a destructive flood which occurred in the 1950's. This man was present all along the public participation process, and he could use all the available documentation; but he finally decided to go to court against the project via a small mill-owners association.

For their part, farmers refused to admit that they overdraft the water: the most important irrigators appeared to be downstream close to the Dordogne merger, while the Céou dries up in the upper reach, in the Lot *département*. In this section, farmers and water officers did not really feel concerned by a small river which flows elsewhere. They did not have water meters, conversely to Dordogne farmers; but the latter could take advantage of more regular flows to use mobile pumping equipment trailed by their tractors, to take water by night. In short, there was a serious knowledge gap both on the river flows and on pumping in various seasons.

Facing these various conflicts, which bear rather on quantitative hydrology issues than on hydrobiology, EPIDOR decided not to study the situation itself, but to open the quantitative analysis to tendering, so as to gather the various data available from the various stakeholders and administrations. The tender was won by the commercial subsidiary of the BRGM (French geology survey). With a budget limited to 39,000 Euros, this company mobilised a well qualified hydrologist, who, unaware of the on-going conflicts, did not visit the area himself but rather employed young staff to do it. When he had to present his results, stakeholders could object that he had not incorporated their own knowledge, that he had not done any fieldwork. He could only answer that the budget did not allow to do more than what he did, and that on top of it, some data holders had refused to give them, and wanted to charge for their delivery. In short, even if the karstic nature of the area might be a cause of the river flow drying up, pumping by farmers should be excessive, and should be studied specifically. EPIDOR then requested supplementary analyses, which the team did, but arguing that they ended up spending 50% more than the allowed budget. In the end, nothing could bring the stakeholders to bring their views closer.

In other words, we are facing a case where the information tool is limited to a technical study of water availability and of rough present and future demands<sup>1</sup>, led separately from the discussion organised by EPIDOR. The end result is that the author is “taken hostage” in the pre-existing conflicts and becomes the scapegoat. Hydrologists usually work for their clients as if these were benefiting from a superior legitimacy and consensus between stakeholders. Conversely EPIDOR wanted the study to level a conflict in which it was *de facto* involved. They could only disagree. Conversely, in the Cère case, the long and patient fieldwork by the lady in charge of organising the contract, provided her with a legitimacy which allowed her to better diffuse the technical knowledge. This illustrates the need to build up the scientific and technical information needed for integrated water management in constant interaction with the learning process as it takes place between the stakeholders.

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<sup>1</sup> In the phase one report, called inventory, the description of potential conflicts is a half page out of a total of 42.

## 4 Analysis of the Process

### 4.1 Reframing of issues and institutional rearrangement

The development of the social learning process in the Dordogne goes through two different phases, which correspond to the main levels of intervention (whole river basin; more localised areas). In each of these phases, questions and problems about water are reframed in parallel with institutional rearrangements. Social learning can thus be seen as a two-step, cumulative process: firstly, the construction of the Dordogne as a political issue in the public sphere; secondly, the operationalization of this new status in substantial interventions.

The first reframing of water issues occurs in 1991 through the “Dordogne Valley Summit” process. In this case, social learning consists mainly in the creation of a new institution (EPIDOR), which forges new links between pre-existing networks of institutions and actors (social, technical as well as political ones) concerned with the river. The diagram n°3 (see next page) depicts the main relations between EPIDOR, these networks and other institutions intervening in local water policy:

The networks linked to EPIDOR (represented by the interconnected grey spheres) defend varied but converging interests : some seek to boost the economic development of the Dordogne valley, by promoting it as a tourist destination (political actors, local councillors and their supports at the national level); others want to defend the river and its traditional landscape against the overexploitation and the destruction of its resources (local mobilisation against gravel extraction); still others aim to protect the aquatic environment for itself or for fishing purposes (environmental associations, scientists and professional fishermen). The networks are built up in parallel and for some in direct opposition to pre-existing coalitions between state sector administrations (industry, public works, agriculture) and economic interests (see the grey sphere, bottom-right of the diagram).

The institution rearrangement is based on two types of interconnection between actors: first, it relies on close collaboration between technicians and scientists studying the river, local actors struggling to promote a more ecological management of the Dordogne, and users with a good practical knowledge of the river and its species (professional fishermen). Their collaboration results in several research programs focused on local concerns whose findings are largely publicized (through the research works of the “Dordogne Basin Institute” for example, or the exhibitions of the “Sarlat Aquarium-Museum”). It enables an aggregation of scientific and local knowledge on the river, which makes possible a diagnosis of the Dordogne problems based on scientific and empirical facts.

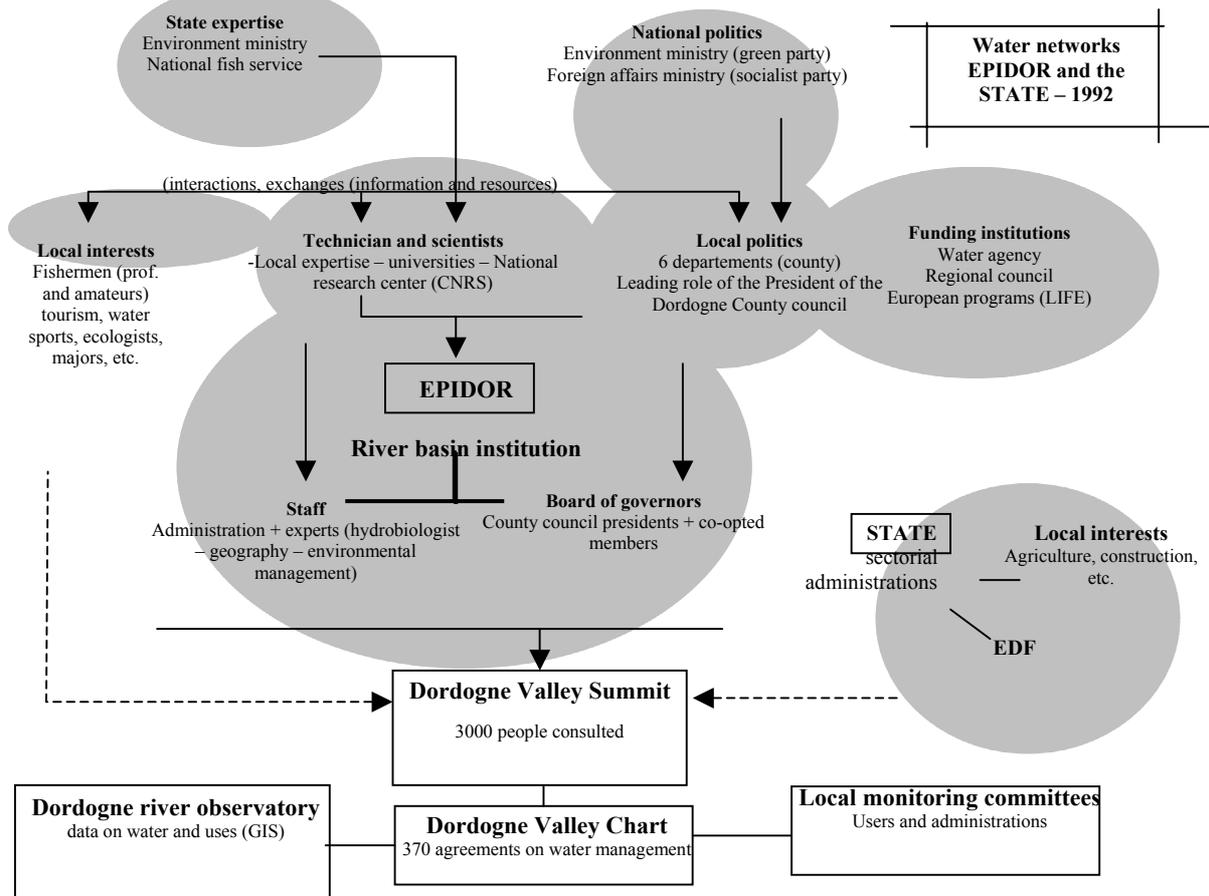


Figure 6: Water policy networks (1992)

Second, EPIDOR benefits from strong political support which legitimizes the project. This support is pivotal to obtain public funding, which is necessary to launch and to keep up the collective action. Some of the political actors are only temporarily involved (prompted by local elections, in March 1992, one month after the “Summit”); others are more perseverant, such as the county councillors concerned with the economic development of their region). Political actors bring to EPIDOR the democratic legitimacy of local authorities – the Presidents of County council are symbolically seated on a platform, above the round table during the “Dordogne valley summit”. More concretely, they sustain financially the river basin institution (staff salaries, various investment and operating costs) and also have the majority on the EPIDOR board of governors.

The “Dordogne valley summit” brings the river and its problem to the fore; it publicizes the issues of water releases, river pollution, flood prevention and many others. It also leads to the setting up of visualization tools, aiming to document these issues objectively.

However, this type of social learning is subject to limitations in that first phase. The knowledge about the river remains vague and general, as well as the management objectives and programs, due to the scale of intervention (the whole river basin, 24.000 km<sup>2</sup>). The river becomes in 1992 a public, political issue, but this evolution has not yet been translated into management practices.

From 1995, a second social learning phase takes place in more localised areas and for specific issues (for example during the water level management or the two river contract processes). It also entails issue reframing and institutional rearrangement. For the three cases considered, EPIDOR plays an active part but the type of social learning is different in nature : it concerns a specific, localized issue and a few actors only are usually involved. The results in this phase are at the same time more

concrete and more limited than the previous phase. The issues are more technically documented, with a more precise knowledge of the situations to manage (new cartographies, data bases and analysis on small territories) and more diffusion, which allows a more shared vision of the river (for example between EDF and the fishermen). Some substantial evolutions are brought to the river management (through river contracts operations, management protocols on water releases). Besides, one paradoxical side effect is that some actors tend to criticize the first type of public participation process, as too general and ineffective (such as the “Dordogne geographical commission” of the Water agency, a more regular stakeholder meeting, equivalent to the “Dordogne Valley Summit”; see diagram n°1, p. 15).

The situation in terms of public participation may be compared to that of public discussion on urbanism. Master plans are elaborated for large territories by technicians and elected representatives; their content remains rather vague and does not give rise to a strong public participation. However, their local translation into communal planning documents prompts more participation, but also brings about more protests and conflicts linked to private property concerns.

One of the main objective of the EPIDOR process was to improve this situation by encouraging people to perceive themselves as users of a common property, and not only as private owners. The attempt is only partly successful: public programs are decided and implemented, based on the recognition of the “common property” status of the river; however, farmers, riparian owners, and other users are still reluctant, in many cases, to abandon or share their property rights.

## **4.2 Critical events**

For the first type of social learning (the EPIDOR process) the main turning point is the “Dordogne valley summit” itself, which plays a major symbolic role, as a founding event. The participants keep a living memory of the summit, due to its exceptionality and the large media coverage (local and national newspaper, TV and radio news). In 2001, the general assessment of the water policy in the Dordogne river basin also refers to the Summit, whose 10-years anniversary is celebrated. In this case, social learning is very intensive and entails a large mobilisation of means (technical, political, mass media) during a short period of time (a couple of days; even if it is preceded by much longer preparatory and networking phases, as has been demonstrated).

As regards the water level management process, the critical event is the lawsuit launched by the association of fishermen against EDF, which obliges the latter and the administration to be more aware of the issue and more responsive to the concerns of civil society actors. Through the litigation process, the association can publicize its concerns about water, in spite of very limited means (a few voluntary members, no public funding). A second turning point is tightly connected with the first one: it occurs when EDF and the fishermen decide to abandon their conflicting relationship and open a negotiation phase. The studies commissioned in 1999 and the subsequent discussions are conducted on the basis of this pre-agreement which triggers a new social learning process.

As regards river contracts, the crucial event is the official signature of the contract, which symbolizes the transformation of the river into a public sphere (and not only an aggregation of private properties) However, for the two cases, the later evolution differs after a second turning point, which concerns knowledge production and dissemination. In the case of the Cère, the presentation of the database to local councillors and members of the local community laid the foundation of a shared vision, after its long-term elaboration in the field. The river atlas increases the dissemination of this vision. Conversely, the public presentation of the hydrogeological study, in the case of the Céou, does not improve the relationship between actors, who remain opposed on the options of river management as well as on the diagnosis. The social learning process is blocked, at least temporarily.

### 4.3 Mechanisms that foster social learning

Three key elements play a crucial role in the social learning process in the Dordogne river basin.

- ► It is first important to emphasize the **cumulative nature** of the social learning, which progress from general to local issues. The success of local, operational management depends on the credibility and the organisational means of the river basin organisation. The two localised public participation processes illustrate the importance of a strong river basin institution, benefiting from social, political and technical support (created and strengthened in a previous phase, as for EPIDOR)
- ► Secondly, social learning is improved with the intervention of a **technical mediator** which articulates the production of specialised knowledge with local concerns. In two successful cases, (Dordogne valley summit, Cère), the exchanges between experts and stakeholders are intense and lasting, with the help of a go-between (respectively the EPIDOR staff and Cère project leader). Conversely, the case of the Céou shows the limits of expertise in conflicting situations, where local actors may refuse to give credit to studies or diagnosis. A work of technical mediation is even more necessary in these cases.
- ► Thirdly, it appears particularly important to obtain the support of traditional political representatives to the public participation process and to the new vision of river management. Acting as **political mediator**, they can connect the local communities to the river basin institution, which does not know usually how to deal with local groups and social networks. In the Dordogne basin, moreover, the local government remains the main support of integrated water policy, compensating the absence of state services in this area.

### 4.4 Barriers to social learning

The governance structure and the pre-existing distribution of water rights are the main obstacles to social learning. Both hinder the setting up of the management of water as a common resource. The public (state) and private property of water is the main cause of difficulties. On the one hand, if the state, owner of the Dordogne river (water, bed and banks) participates in the “Dordogne Valley Summit” process, its involvement appears superficial and temporary. During the implementation of the “Dordogne Valley Charter”, attitude of the state services (*Préfets* and Agriculture administration mainly) is more oppositional than supportive. Similarly, the state administration for industry speaks more in favour of EDF than it promotes the water level management process. On the other hand, the main opponents to the river contract process are the riparian owners and the farmers, who refuse to abandon their prerogatives (i.e. respectively, the control on river banks and an unlimited access to water).

A second series of obstacles to social learning appears when the governance structure has to evolve in relation with the progress of water management. The political supports which are necessary are usually not sufficient or may be absent (in contrast to what happened in 1992 for EPIDOR). This point is illustrated by the attempts of EPIDOR staff, not yet successful, to find national political support to call into question EDF exclusive control on water flows. In that case, social learning is brought to a halt due to the lack of political decision.

### 4.5 Specific roles of information and communication tools

The IC-tools that have been observed can be classified into three categories.

- IC-tools perceived by the users as easy to use (*e.g.* photographs, thematic maps... which does not mean that their design is simple...);
- IC-tools perceived by the users as complex to use but for which guides exist which formalize this use (typically GIS);
- IC-tools whose use remains experimental, i.e. which requires a specific operator (often a scientist or a person involved in the research action). These IC-tools are not available on the market and their use is still little formalized.

Most of the IC-tools that have been used in our case studies were very simple: 2D or 2,5D charts, 3D models, maps and photographs. Some more sophisticated tools have been used in addition to the first ones (GIS, databases, Web sites) but they are already widely used and documented. Other tools, less diffused in the public sphere or among the River basin management community, have only been used in experimental situations with the support of researchers as observers or tool operators.

EPIDOR IC-tools have been identified as important intermediary objects between river basin reality and stakeholders, between stakeholders themselves and between stakeholders and the public:

Some major functions of ICT have been identified and are presented in the following list:

- Establishing a shared river basin ontology (between the members of the territory of action),
- Trying to articulate various empirical forms of local knowledge, so as to build up an image of a shared reality,
- Drawing together local perceptions of situations to constitute a global image of the territory which escapes individual perception (i.e. the hydrographical district scale, art. 3, art. 13 of the WFD),
- Facilitating the identification of all the partners concerned by river basin management,
- Establishing the legitimacy of points of view, the reality of some problems; translating information, formalizing these points of view (charts, maps...), highlighting an experiment (pictures),
- Showing the need for co-operation,
- Articulating objectives to lay down a common orientation,
- Defining priorities of action and identifying areas of priority.

Specific requirements result from the characteristics of the main situations where IC-Tools are used. The selection of the appropriate tool may depend on criteria which vary according to these situations.

Three types of criteria are listed below, with their consequences for IC-Tools.

#### *Presence or absence of the general public*

Two sort of situations have to be considered:

- meetings of stakeholders,
- meetings of stakeholders and general public.

These two situations are encouraged by the WFD (art. 14). However, the second situation differs from the first one by the fact that the public has to be convinced to participate to the river basin management process. Its stakes in the river basin and its interest to participate have to be demonstrated. Consequently, the forms of information and communication and the IC-tools to be used will be different.

### *Presence or absence of a shared territory*

It seems that a distinction has to be made between IC-tools used to share or organize different points of view concerning the same area and IC-tools used to build a shared territory by aggregating elementary territories.

The first situation refers to territories usually practised by the actors involved in river basin management (EDF, fishermen of migratory species, EPIDOR...). So, they do not need to build together the territory based on their common management but they must share their points of view. On the other hand, in the second situation, it is necessary to demonstrate to the various actors their interest in being involved in the management of the territory. In this case, the shared territory does not exist yet and it must actually be built up. It occurs for example when the mayors of communes within a river basin have to be federated. It also happens when local points of view in the definition of river basin management are taken into account, these points of views being based on (much) smaller scale experiences. This issue will occur when the public is consulted (art. 14 of the WFD) on the river basin management process produced at the hydrographic basin scale (art. 3, art. 13). How should one bring together different feelings and knowledge coming from local practices to a large territory whose scale is incompatible with direct real-life experiences? In this case, IC-tools allow the aggregation of basic real-life spaces and / or to put into perspective various points of view concerning a same shared space.

### *Types of relationships between actors*

Four configurations have to be considered in this regard:

- Face to face interrelationship when the managed territory is directly perceptible or is at the scale of usual practices (local situation or specific problem);
- Face to face interrelationship when the managed territory is not directly perceptible or is not at the level of usual practices;
- Time distributed interaction;
- Space distributed interaction.

The utility of *artefact* to support information and communication processes is less evoked when the territory is a real-life space and the actors are in co-presence interaction. Field visits are often preferred. However, this does not mean that the IC-tools do not have any impact. Indeed, they may have non-intentional side effects.

## 5 General Reflections

### 5.1 Public participation and its consequences in terms of social learning

The public participation process in the Dordogne river basin (1991-2004) mainly results in the transformation of the institutional framework and the emergence of a **new actor**, EPIDOR. The “Dordogne valley summit” and the “Charter” increase the legitimacy of this actor, which becomes the “voice” of the river. Since then, it has remained the main support of an integrated water policy and one of the first defenders of the environmental cause in the basin. EPIDOR has also built up a new vision of the river, which corresponds to the emerging concerns of the population and local authorities. This vision is supported by ecological cartographies, data on river quality, studies and analysis on the migratory species, etc.

The institutional transformation has also modified the **power relations**: the creation of a new actor at the local-regional scale has given more power and influence to new groups of interest and new networks of actors: fishermen, environmental associations, water sports activities, local authorities. In parallel, the strength of pre-existing coalitions between state services and others interests tends to decrease (agriculture, hydroelectricity, construction).

More precisely, two forms of social learning intervene consecutively.

The initial process (1991-1992) gives a **new status to the Dordogne**, which becomes a political issue calling for public intervention. It supposes the intervention of a large number of actors, multilateral discussions and the mobilization of important means (technical, social, political and media resources). Social learning takes place here through different mediations: a symbolic event, production of knowledge and dissemination of data and analysis (Dordogne observatory), the organisation of debates at the river basin level.

The second type of social learning (1995-2004) takes place in more local arenas; it is more operational and concerns **specific issues** which are discussed during face to face interactions (usually between a few actors engaged in bilateral conflicts). This form of social learning, when it succeeds, results in new forms of water management, new roles and attitudes and relations between water users.

This **two-step approach** followed in the Dordogne river basin, from a large area to more localised ones, and from general concerns to specific issues, can be related to the **dominant public participation culture in France** and the historical importance of the state and private property. The prevailing form of public participation is still the “public inquiry”, where the administration (representing the public good) consults only *individual* actors whose property rights are protected by the law. The two-step process is then necessary to disseminate progressively new practices and attitudes in public organisations and the civil society. The first step events introduce a political novelty, transforming the river into a common good. The second draws concrete consequences from this new situation.

Against this backdrop, two main lessons emerge from the analysis of the Dordogne river basin processes. First, social learning occurs in all public participation processes only when a **collaborative production of knowledge** takes place on water issues. In other words, the creation of the river as a public issue demands repeated exchanges between technicians, scientists and civil society (for example in the socio-technical networks before EPIDOR creation, or in the Cère case during the fieldwork made by the project leader). The success of social learning depends on the capacity of technicians and specialists to adapt their work methodologies to the pace of learning of local actors. In both cases, it appears particularly important that they take the time to establish the credibility of the technical diagnosis, or obtain a local validation of the new knowledge produced on the river.

Second, social learning may be brought to a halt even if the first condition is fulfilled, when public participation does not have **perceptible effects**. After a first period of enthusiasm for the new form of democracy, stakeholders may become more and more doubtful about the decision making process; they may lose confidence in the institution which organises the public participation, if it appears powerless or without real influence on public decision-making. A participatory process with only communication or information purposes offers no real incentives to foster the stakeholders' interest; it does not compensate for their efforts to attend meetings, to support the collective action or to adopt new attitudes. Then, the risk of "participation boredom" increases.

## 5.2 Theoretical framework

Our analytical results argue in favour of a large **definition of the concept of social learning**; it includes not only changes in the social representations, visions and ways of thinking (about the river and the interconnections between water users), but also modifications in the governance structure and the technical systems which enable the public authorities to act on the river (visualization and operational tools). This **multidimensionality of social learning** is one of its central features since the lack of one aspect may hinder the whole learning process (see above, "Barriers"). Social learning is more than just about learning or sharing a common vision. It requires the co-construction of such a vision by water users and managers, making organisational, technical and political choices in that direction.

Consequently, a first indicator of social learning is the development of information tools around the river and the degree of their extension and precision, the public availability of data and their credibility at the local level. There is indeed a good correlation between the development of the integrated policies promoted by the river basin institution and the growth of its information system (data bases and GIS) which become more and more reticulated (for example producing an ecological cartography of small catchments in 2000) and more open (internet site).

Another useful indicator of social learning is the degree of stakeholder involvement in the design of the information system. The learning process relies indeed on the credibility of data and diagnosis, which is inextricably linked to the quality and density of interactions between producers of knowledge and local communities. The comparison between Cère and Ceou proves this point.

## 5.3 Generalisation

The case study explores some of the basic mechanisms and factors which play a role in the development of social learning. It also demonstrates the time needed to build an institutional frame, create trust between public authorities and stakeholders and launch a cumulative learning process. Its results may be of **interest for the current implementation of the WFD** in the Dordogne river basin. Given the length of the public participation process and the interval between discussion and decision, the risk of "participation boredom" is important. The case study results argue in favour of indicating more clearly to stakeholders the rationale of the procedure and its expected consequences. It is also crucial to clarify as much as possible the influence of public participation procedures on the river management and their place in the current governance structure. The last recommendation entails a better coordination between state services, river basin institution (EPIDOR) and the water agency.

These concluding remarks apply to the Dordogne river basin but they are also relevant for other parts of France. The context of the **Dordogne river basin is representative** of the situation of water policies at the national level, as regards the political and administrative setting and the positions and attitudes of the main public and private actors. The EPIDOR process is undoubtedly exceptional – due to the scale and the techniques used; but other similar, yet less innovative operations have also been conducted in France. Besides, new planning tools have been developed since 1993 (for example the *SAGE* - "water management and development plans") whose objectives and methods are not very

different. It is worth noting that the pace of learning is also very slow in that case; it took between 5 to 7 years before the first SAGE were published.

More generally speaking, **other public policies could benefit** from these conclusions. In France, the water policies are more advanced than any other public action in public participation terms. They have taken advantage of the early setting up of a legislative and administrative framework (since 1970) and the continuous efforts of the water agencies for many years. As for environmental policies in general, water policy plays the role of a laboratory for new government instruments, providing findings which can be usefully applied to other areas.

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## Appendix A Sources

### Interviews

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- M. BOUZIGES, state services, DIREN, Toulouse
- MM SORMAIL L, ROUX G– EMERIAU, Water Agency, Toulouse
- Mr. DECOUX R, EDF GEH, Tulle
- MM DELORT and DEVOS, state services, DRIRE Limousin, Limoges
- Mr SERRE F , TOS association, Terrasson-Villedieu
- M. PUSTELNIK G, Director, EPIDOR, Castelnaud
- M. MACE S, EPIDOR Project leader, Castelnaud
- M. Daubigé Local Councillor, Daglan
- M. CARVES , Riparian, Castelnaud
- M.. ERHARDT F – EPIDOR, Project Leader, Castelnaud
- M. ROGERARO R, Farmer, Domme
- Mme ROBIC, Fishermen Union, Bordeaux.
- M. BASSERAS X, Communication director, Water agency, Toulouse
- M. CAMEO-PONS, Environmental Association, Toulouse
- Mlle MERLET, EPIDOR Project leader, Rodez
- MM MOUCHE et GUERIN, EPIDOR Information system unit, Castelnaud
- M. NIGOU, Farmer, Aurillac
- M. LIANDIER, Mayor of Vic-sur-Cère, President of River Committee
- M. MALEMOUCHE, Mayor, Bretenoux
- M. COUPRY, Expert, Toulouse
- M. PASCHINI, Water agency , GIS unit, Toulouse
- M. BELLOUARD, County Council (*Département*) , Cahors
- M. JAUBERT, Fishermen federation, Cahors

*(prepared and completed with archives, documentation and reports)*

## Appendix B Examples of IC-tools cards

### 1 . “Léon l’esturgeon” / Léon the sturgeon

- A 2m long 3D resin model of a sturgeon)
- Phase of the process where used : Presentation during major public events.

<i>3.19 Aim of using</i>
<p>First aim: used during conferences on migratory fishes in the Dordogne river.</p> <p>Secondary aim identified through experience feedbacks: to make the visitors react by drawing their attention and by encouraging questions or comments. The organizers are, at this time, very careful with erroneous questions or comments and they correct them (e.g. confusion with a shark, suspicion about the presence of fish of this size in the Dordogne river...). Creation of a community of interest for the Dordogne river by developing a shared patrimonial dimension.</p>
<i>3.20 What training (if applicable) is provide ?</i>
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<i>3.21 Description of how the ICT tools are deployed and generally managed, and by whom</i>
Used in public events to attract visitors attention and to engage a discussion about Dordogne river management, water quality and local migratory fishes. The sturgeon becomes the spokesman of the Dordogne inheritance. Deals with the spectacular and emotional dimensions.
<i>3.22 Role of tools in collaborative management of process</i>
Create a local attraction. Intermediary objects between actors and presentation of the field reality.
<i>3.23 Role of tools in communication and mutual understanding</i>
Encourage discussion. A visual proof of Dordogne patrimonial quality.
<i>3.24 Approach of integrating ICT tools into river basin planning process</i>
Looking for public support
<i>3.25 Ease of use by stakeholders</i>
Strong.
<i>3.26 Problems/Limitations identified</i>
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<i>3.27 Any suggestions for improved use of ICT tools by participants and made through general observation ?</i>
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<i>3.28 Feedback : Impact of ICT tools on stakeholders</i>
Efficient mean to initiate discussion.
<i>3.29 Feedback : Impact of ICT tools on practitioners</i>
Considered as very efficient because it is both spectacular and dumb. Two paradoxal qualities that are exploited by the practitioners (here the staff present on the stand).

## **2 . Cère river GIS and database**

- Built up by Cecile MERLET (EPIDOR staff, Cère river project manager) during preliminary studies before Cère river contract (upstream part of the river). 1/2.500 scale river modelling : banks and weirs description based on existing topographic maps, pictures and drawings.

- Phase of the process where used : phases 1 and 3; phase 2 for secondary effect : used as a technical support during river committee meetings and / or during “petits comités” meetings for elected officials awareness.

<i>3.19 Aim of using</i>
To make an initial inventory of the river (inventory of the little weirs which was the main problem but also of the state of the bank, outlets...).
To produce a data base useful for the elected officials (extracting information about their own territory)
<i>3.20 What training (if applicate) is provide ?</i>
Learning from doing.
<i>3.21 Description of how the ICT tools are deployed and generally managed, and by whom</i>
Used by Cecile MERLET when she was managing the Cère river contract. Presentation in working group or with the elected officials in face to face situations.
<i>3.22 Role of tools in collaborative management of process</i>
Showing the relations between the various territories crossed by the river or drained by its tributaries, building a community of interest within the elected officials. Allows to describe interdependencies. (“ <i>That encourages elected officials to federate ...</i> ”). Each elected official can see [by zooming] his small part of river but also the neighbour’s one. Since this tool was very visual, it encouraged to include/understand the problem of the others, to open their river, their horizon. (“ <i>... it removed the blinder that they all had ...</i> ”). → important to prioritize problems.
Establishing Cecile MERLET’s legitimacy in the view of elected officials and stakeholders who considered her as the reference person (it seems that this function does not operate, at least in the same proportion, for her substitute or for EPIDOR, the institution which employed her). This aspect also relates to Cecile MERLET’s strong presence in the field, as mentioned by different stakeholders who met her during the field data collection phase (she surveyed 200 km of river during 2 years).

<i>3.23 Role of tools in communication and mutual understanding</i>
Creation of a community of interest among the elected officials.
<i>3.24 Approach of integrating ICT tools into river basin planning process</i>
Knowing the relations established by the environmental system (RB, water flow, nitrogen and bacteriological pollution) between the various territories crossed by the river or drained by its tributaries.  The GIS water quality maps helped tourism stakeholders (Lacapelle dam) to put into perspective the stakes related to tourism and to convince Aurillac water treatment plant stakeholders to speed up the upgrading of the plant.
<i>3.25 Ease of use by stakeholders</i>
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<i>3.26 Problems/Limitations identified</i>
The main problem concerned the tool ergonomics (carrying the computer, no projector...). The period to build up the GIS was very long (6 months to design it and 18 months for collecting and entering data) but necessary to develop a good factual knowledge of the river and to win the trust of the stakeholders. Data collection physically tiring.  Data collection funding (cost was estimated for 90 weirs listed by IGN, and 169 weirs observed in the field!), extension of the surveyed area and data availability (only 5 authorizations registered by local authorities).
<i>3.27 Any suggestions for improved use of ICT tools by participants and made through general observation ?</i>
Improving data display using video projector.
<i>3.28 Feedback : Impact of ICT tools on stakeholders</i>
This tool has encouraged the stakeholders to federate themselves.  Increase Cecile MERLET's legitimacy (data-gathering & manager of the tool).  Actors mostly remember the photographic supports which illustrate a sharing of reality, reality already known by the actors but which can now be put into perspective.  The quality of the tool increases the importance attached by the local stakeholders to the managed object (here a small river considered before as negligible). The tool itself represents an investment which illustrates the importance attached to the river. It also allowed to better convince the french ministry of environment about the quality of the local technical management of this river. Thus, it reinforced the trust of the ministry in the local authorities and stakeholders and favoured the agreement on the Cère RBMP.
<i>3.29 Feedback : Impact of ICT tools on practitioners</i>
Increase Cecile MERLET's legitimacy (data-gathering & manager of the tool) → allows to impose herself as the coordinator of all the projects on this river.

Use of the iconographic part by other practitioners (other technicians of river: “Pays” and “Communauté de communes”) who made a slide show about the Cère river flows.

## Appendix C Chronology

	Action related to river exploitation	Action related to river preservation	Bureaucratic organisation ( <u>river-basin level</u> )
<b>16<sup>th</sup>-19<sup>th</sup> cent.</b>	<b>Agricultural and navigation uses</b>	-	
<b>1566</b>	« Edit de Moulins » Navigable rivers (water, bed and banks) are state property .	-	Royal administration
<b>Post-revolution</b>	1843 : first dam on the Dordogne (for navigation purposes )	-	State Administration ( <i>départements</i> )
<b>20<sup>th</sup> cent.</b>	<b>Main uses : hydroelectricity, gravel extraction, irrigation.</b>	1910 : salmon extinction in the Dordogne	Electricity Companies (Public Corporation in 1945 - EDF)
<b>1920-1967</b>	Dam building for hydroelectricity production (1 MM3)		+
<b>1945 - 1980</b>	Major gravel extraction in the river		Industry Inspectorate
			+
			Public Works and agricultural administration
<b>1965</b>			<u>Dordogne Valley Tourism Association</u>
<b>1970</b>			<u>Adour-Garonne Water Agency</u>
<b>1974</b>		Local protest against gravel extraction (ecologists and riparian owners)	
<b>1975</b>			<u>Dordogne Valley Planning and Development Association</u>
<b>1976-1980</b>		Plan Saumon (State and local public programs)	Dordogne Basin Institute (scientific-citizens network)
<b>1977-1980</b>		«Clean River Dordogne» State-local program for river improvement	
<b>1981</b>	National banning of in-stream extraction.		
<b>1989</b>		Local-scientific actions for ecological awareness (Sarlat Museum-Aquarium) and Dordogne restoration	

		First Salmon observed on the Dordogne	
<b>1991</b>			E.P.I.DOR. (Etablissement Public Interdépartemental de la Dordogne)
<b>1992</b>	<p>« Dordogne Valley Summit«</p> <p>basin-wide concertation on river management.</p> <p>=&gt; « the Dordogne Valley Charter »</p>		
<b>1992-2000</b>		Public works for river management , fish ladders...	
<b>1998</b>	Negotiation on water flows (EDF – fishermen – preservationists)		
<b>2001</b>	The Dordogne Convention (Etats Generaux) Evaluation meeting with River Stakeholders on the implementation of the Charter		
<b>2001</b>		Around 1000 salmon in the Dordogne (est.)	
<b>2002-2004</b>	Specific public budget for the Dordogne Area (convention interregionale Dordogne)		