



Water and Ethics

INSTITUTIONAL ISSUES

Bernard Barraqué



UNESCO International
Hydrological Programme



World Commission on the Ethics of
Scientific Knowledge and Technology



Water and Ethics

INSTITUTIONAL ISSUES

Bernard Barraqué



UNESCO International
Hydrological Programme



World Commission on the Ethics of
Scientific Knowledge and Technology

The authors are responsible for the choice and the presentation of the facts contained in this book and for the opinions expressed therein, which are not necessarily those of UNESCO and do not commit the Organization. The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Series on Water and Ethics, Essay 11

Published in 2004 by the United Nations Educational,
Scientific and Cultural Organization
7, Place de Fontenoy, 75352 Paris 07 SP (France)
Composed by Marina Rubio, 93200 Saint-Denis
Printed by UNESCO

ISBN 92-9220-026-7

© UNESCO 2004

Printed in France

Preface

This essay is one of a series on Water and Ethics published under the International Hydrological Programme of UNESCO. A Working Group on the Use of Fresh Water Resources was established under that programme in 1998. Preliminary drafts on fourteen aspects of this topic were prepared under the guidance of this Working Group.

An extended executive summary was prepared by J. Delli Priscoli and M. R. Llamas and was presented to the first session of the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) held in Oslo in April 1999. At the latter meeting, COMEST established a sub-commission on the Ethics of Fresh Water under the Chairmanship of Lord Selborne. The first meeting of this sub-commission was held at Aswan in October 1999. A 50-page survey by Lord Selborne on the Ethics of Fresh Water, based on the above meetings and documents, was published by UNESCO in November 2000.

Since then, the original draft working papers have been revised under the editorship of James Dooge and published on CD ROM as an input to the Third World Water Forum held in Kyoto in March 1993. These are now being published in printed form as the first fourteen titles in a series of Water and Ethics

These essays are written from the point of view of experts on different aspects of the occurrence and use of fresh water who are interested in the ethical aspects of this important subject. They do not purport to be authoritative discussions of the basic ethical principles involved. Rather, they aim at providing a context for a wide-ranging dialogue on these issues between experts in diverse disciplines from the natural sciences and the social sciences.

James Dooge
John Selborne

This particular essay deals with the institutional dimension of ethical issues in freshwater management. Following a short historical introduction it contrasts the position in regard to water rights and the institutional structure of a number of European Countries. It stresses the dangers of applying simplistic solutions to the present complex situation.

Bernard Barraque is Research Director on Public Policies for CNRS at the Ecole Nationale de Ponts et Chaussées in Paris.

Contents

1. The institutional dimension
2. Historical development of water rights and institutions in Europe
3. The British case
4. The French case
5. Countries with subsidiarity
6. Mediterranean countries
7. The Spanish case
8. Analysis in terms of water ethics
9. International rivers
10. Ethical issues in public water services provision
11. Answers to municipalism's crises
12. Ethical issues in demand side management
13. Conclusion
14. References
15. Additional bibliography

1. The institutional dimension

At the beginning of the twenty-first century, water policies and institutions are increasingly in the middle of ethical institutional considerations: opponents of ongoing forms of globalisation contend that water might become a market good, and thus would be made unavailable for the poor of the planet. Being essential for life, water is a common good, the access to which must be maintained for all. If this can be considered as a general moral principle, the ethical issue is, more practically, how can we design water institutions which are both economically efficient, and compatible with the democratic principles which we believe are superior to other forms of government. In particular, in this paper we would like to discuss the competition/complementarity of River Basin Institutions and traditional territorial administrative institutions. When Karl Wittfogel (1957 and 1964) conducted his research on the political, anthropological and religious conditions which made past 'hydraulic societies' so sustainable, what he had in mind was to compare this 'oriental despotism' with the Soviet Union, dominated as it was by Stalinism. Since then, additional research has led to mitigate the initial vision of pure despotism in antique water empires, and many observers have praised the economic development associated with hydraulic projects; but others have been fascinated by the power they carried along, and they have tended to consider modern large hydraulic schemes as potentially carrying along dictatorship within countries, and 'water wars' between countries. In the twenty-first century water wars are even supposed to take over from twentieth century Oil wars. The Near and Middle East is particularly concerned, but other zones of conflict have been identified, even in North America. William Karlh (1982) has entitled his history of water conflicts in Southern California *Water and Power*, and Donald Worster (1986) starts his analysis of water management in California with a long chapter on Wittfogel's thoughts.

However, one should certainly not exaggerate the risk of water wars in the opening century. While the media have popularised this idea initially developed by hydrologists and ecologists as a potential extension of water stress, social scientists have carefully reviewed both the situations of shared waters and the so called water wars, and they have discovered that the proportion of international rivers with conflicts was minimal; and that most conflicts where water was involved were not water wars, but at best, wars where water could be taken as a weapon or a leverage tool (Turton and Solomon, 2000; Wolf, 1998). Besides, most conflict situations in terms of water sharing or re-allocation are domestic rather than international: big hydraulic schemes in particular are more frequently challenged both by economists and ecologists when they are domestic, only because they are more numerous.

Indeed, it is not only within dictatorships that State water management has become an ethically sensitive issue. Medha Patkar, a member of the UNESCO Working Group on the Ethics of Freshwater Use, can testify how hard can a water policy be on people living in an area which 'the largest democracy in the world' has decided to drown in a reservoir for the sake of water-based development (Sangvai, 1998; Roy, 1999). In fact, after the 1929 economic crisis, even democracies turned towards government intervention in the economy, via the realisation and the development of infrastructures. Dominant western capitalist countries were also in favour of large hydraulic projects realised by the State, and they basically agreed with eastern socialist countries to push a Statist model of water management in the third World.

There was of course a difference between these projects and those of ancient hydraulic societies, in that the technical and economic capacity had increased to such a point that it was not necessary to enrol as many people to build them and maintain them, nor to keep them under rigid and hierarchical social structures; besides, they were often basically aiming at providing more means to individual entrepreneurs or public decision makers to realise their economic schemes, thus allowing them to escape the communitarian traditions of resources management. Conversely, modern water uses needed data which transformed the public knowledge of water data and gave a new importance to States. This was particularly the case with hydroelectricity projects, which gave a considerable impetus to hydrology and knowledge of surface water flows. For a long period of time, knowing and harnessing rivers seemed to go along. However, starting from the 1960s, doubts increased progressively about the real economic efficiency of these projects, while negative external effects on the environment were increasingly identified. A general movement to defend local community development against State hydraulics developed, and way back in the early 1970s dam projects were stopped in California. Shortly afterwards, also in the United States, another movement developed in favour of privatisation, thus complicating the ethical issue: do we want more or less public institutions on water, or do we want different type of governance? Do we want State and public water, markets and private water, or a different governance and water as common property? The issue has been popularised by the provocative 1968 article of Garrett Hardin, *The Tragedy of the Commons*, arguing that the only way to prevent the degradation of natural resources by selfish overexploitation in a liberal society was to privatise them. The answer by Siegfried Ciriacy Wantrup (1995), the father founder of natural resources economics, is unfortunately not known as well: he argues that not only in traditional community-based societies, but also in many European countries today, liberal forms of government can perfectly co-exist with maintained institutions for the management of the commons. The environmental movement has in particular put forward the idea of water being best managed by its users at the level of the river basin, which usually

does not correspond to administrative boundaries or to market territories (in particular, users of a river are usually well defined and in finite number; water is not a free-for-all).

Neo-classical economics has also advocated to develop economic instruments like the polluter pays principle (PPP), so as to diminish the regulatory role of government. Many experiments have been attempted, but they have usually been assessed only in terms of efficiency, and economic equity: the idea of finding a good and productive compromise between economy and ecology, typical of second generation policies, was still leaving aside problems like social acceptability, public implication, etc.; the potential contradiction between the solidarity and common property approach in river basin experiments, and the individual responsibility and rational actor principles which underlie the PPP has been overlooked. Generally speaking, the ethical issue was left aside or simplified, just as if it was obvious that a government devoted to development and taking the environment into account was necessarily doing well. The social dimension was ignored. Sustainability has been defined by the United Nations as the pursuance of three simultaneous goals: economic self support, environment protection and improvement, and ethics, i.e. equitable treatment of categories of population, democratic processes, transparency and acceptance by the public.

The ethical dimension of sustainable water institutions can be discussed in a comparative analysis between countries, and in a long historical perspective: how did the modern State develop its intervention on water, was it against or in support of traditional community management, and what are the issues today? The making of the European Union provides a double opportunity: there is a real European need to confront Member States' legislation and water administrations, if only to assess the impact of the European Directives; and there are research funds available. This essay relies on the 'Eurowater' research conducted in collaboration with a network of (primarily) European researchers and consultants, funded by the EU DG XII (research), and by several foundations and institutions devoted to water management in member States. We have precisely proposed to tackle the issue of sustainability of water policies with the 'three E's' *problématique* which we apply both water resources management and public water services provision. It can be summarised in 3 sentences: is the policy economically viable (capable of self financing in the long run), and environmentally sustainable, and also socially and politically acceptable? This is indeed the challenge posed by the Water Framework Directive (WFD) adopted by the European Union in October 2000 (EC 2000/60): for each of newly designed 'hydrographic districts', recovering a good ecological quality of the aquatic environment, through 6-year programmes prepared with public participation, and with cost recovery schemes promoting an efficient water use.

In the following, the issues of water resource management institutions within countries, and then the issue of transnational rivers, will be covered first. Lastly, the specific issue of institutions devoted to water services provision (water supply and sanitation) will be addressed. There is also a debate about the public vs private provision of water services, but it is considered here as a different debate from the one about privatisation of water resources and water markets. Both debates are unfortunately often amalgamated in the press, which tends to blur the ethical issue of respective institutional debates.

2. Historical development of water rights and institutions in Europe

If one wants to understand why the legal systems are different in neighbouring and yet geographically small countries (e.g. French civil code, and English common law) one has to go back to the early Middle Ages. The old Roman Empire tradition to distinguish between public (state) and private goods was then challenged by the communitarian customary law which Germanic tribes brought with them (the *Markgenossenschaft*). Under this regime, water was considered as a thing in common use, and it gave rise to common management institutions like water tribunals (in the Visigothic part of Spain and southern France), or waterboards (*Waterschappen* in Dutch-Flemish, *Wateringues* in French) in the lowlands close to the North sea. Many other countries (Denmark for instance) have kept local water management associations alive and acting, even though they did not institutionalise them as the Dutch did.

In fact, this was not a complete break away from the Roman system, since the Romans also had a category of waters under the status of common thing to all, only subject to rights of use. This has been clearly described by Caponera (1992), in the first synthesis of water laws in the world since Antiquity.

Simply stated, ancient Roman law subdivided water resources into three categories:

- (i) waters common to everybody (*res communis omnium*), i.e., waters not capable of being the object of any ownership status. No one, whether individual, the community or even the state or the sovereign could own these waters; together with air and the sea (shore), they could only be the objects of rights of use. All flowing waters belonged to this category.
- (ii) public waters (*res publicae*), i.e., those belonging to a community, municipality or other public institution. The use of such waters was reserved to the institutions,

which had a legitimate title over them. Institutions could, in turn, grant a right of use to other users.

- (iii) private waters, i.e., those privately owned. Only a small part of water resources were considered private: rain water, groundwater and minor water bodies. Generally, the ownership of these waters was attached to the ownership of land. The landowner had an exclusive and unlimited right of use (and abuse) over such waters, and this right of use was without any restriction, independently of the consequences that the use could cause to neighbouring lands (*ius utendi et abutendi*).

In Roman law the right of ownership and use of water recognized to the landowner was necessarily limited both by similar rights of neighbouring landowners and by the rights acquired by or granted to third persons by the state. As to the rights of neighbours, Roman law, which regarded water as a constituent part of the land, left the owner entirely free to dispose of all the water found on his land without any consideration for his neighbours but made him liable to suffer similar treatment at their hands.

Most flowing water then was a thing in common use for a finite number of riparians and other right holders like fishermen. Local customs would define the rights of the various users.

When the feudal system developed, however, the corresponding legal set-up distinguished the peasants' community law and the lords' law. The second was the *dominio eminens*, and it carried the right to use and abuse (e.g. the right to take water away from a river and transfer it out of the basin), while the first, *dominio utilis*, entailed only right to use. Things were in practice very complex, since the King could give a territory in tenure (eminent domain) to a vassal or to an abbey or a community, and so could the vassal to his vassal; while the King or the tenant could grant the right to use only to a community; and lords had to respect anyway the customary rights to use. The situation grew in complexity in most countries, and one of the duties of the modern States was to simplify and harmonise these legal systems for the sake of equity and reduction of transaction costs. But it has remained very difficult and time consuming. For instance it seems that in Germany harmonisation of local regulations on water and drainage associations could only be achieved in 1957, through the Federal *Wasserhaushaltgesetz*.

After the Renaissance, old Roman law was rediscovered, compiled and mixed with elements of customary law to make the written laws of emerging Nation-States. Monarchies wanted to develop navigation, timber flotation, and also aqueducts to bring water to capital cities, and they needed to strengthen the definition of public waters. But landownership developed, and groundwater, 'closed' waters like ponds and rainfall were considered as *res nullius* and left to private ownership. This process

culminated with the creation by Napoleon of the civil code, where all goods had to be either public or private. Non domanial rivers (i.e. non State-owned public waters) remained the thing in common use to their riparians, but in France and in Latin countries, community management was increasingly subjected to administrative review and control. Conversely in Northern member States of the EU, even though many of them adopted the civil code, the right to use waters was maintained as it had been, i.e. dissociated from right to own, and ownership did not necessarily entail right to use and abuse. Community spirit in water management was maintained through the general recognition of the subsidiarity principle (Barraqué, 1995): typically, in Germany, urban local authorities and associations were considered as the principal shield of citizens against the arbitrariness of central government. And this is why they have kept and developed modern forms of water services provision, including formal privatisation, to keep them in the local public sector (see below). Typically, subsidiarity leads to a multi-layer institutional set up where each level has to perform some tasks and to adopt its own rules and taxation to do so; it also controls the action of lower levels and is controlled by the upper level. In the liberal state conversely, public action and control over public action must be clearly separated, the second being largely monopolised by central government.

France and England invented the liberal central form of government, and have had a broad difference with the rest of Europe: democracy first developed at national level, with less importance left to local communities. Typically, today, subsidiarity hasn't been an important political concept in these two States until the making of the European Union; then it has often been interpreted as being limited to the breakdown of tasks between the national government and the Union, while in other northern member States, the concept is much more general and relates also to local government, and even starts from the individual and the family (Barraqué, 1995; Kraemer, 1998).

3. The British case

In England, water law is primarily derived from the common law, which derives from the Germanic type community customs. However, there is a big difference, in that the common law is the product of a unification and harmonisation of local customs at national level by a unified body of judges over the country. Besides, British common law is more feudal than communitarian. In particular, with the constitutional monarchy in the seventeenth century, the alliance of aristocracy and bourgeoisie was made to the detriment of peasant communities, which were driven off the land (the enclosures, legitimised by the so called 'scelerate laws'). Furthermore, the common

law is mitigated by another legal concept, equity, according to which in the middle ages the King's Lord High Chancellor, in the modern period the Parliament, and now the minister in charge, can reverse a court decision made following the common law if it is considered as inequitable. Which gives a great deal of power to the central government, all the more so that local powers are devolved by the centre, and can be taken back.

Concerning water, the common law is expressed by the 'riparian rights', under which all riparians of a river can use it, but must give the water back as it was when they took it. In case they don't, they need the consent of the other riparians, or a court decision. And indeed, since cities needed to divert increasing quantities of water from rivers (which in the UK are rather small), equity principles had to be mobilised against the common law. Conversely, constraints imposed on individuals for the common good must be compensated, in application of an old Middle Ages rule called the Taking; but the tradition of commonwealth and strong national identity implies that the amount of compensation remains limited.

This legal system has been adopted by the Eastern United States, and by those bordering the Pacific ocean, while in the arid south west, the doctrine of prior appropriation has prevailed (first in buys an ownership right, the others can only have the rest or purchase the water of the first owner). The difference with the UK is that private property has a much more important status: in the United States of America one tends to consider riparian rights as ownership rights, and the 'taking issue' has been mobilised in a much stronger manner by land owners to defend their interests against the State (Banta et al., 1973). As we'll see below, this is a characteristic which the United States of America shares with France.

In Britain, the most important water use by far is public water supply and sewage disposal; industrial premises are usually connected. Given the relative scarcity of the resource, England is one of the cases in Europe where water service and water resources institutions overlap. Geographic conditions however only partly explain present centralisation. Political history is another cause.

In the second half of the nineteenth century, within the historical compromise between liberals and the emerging labour movement, the local authority became the locus of early welfare policies; water supply and sanitation, as well as the realisation and management of infrastructure, became an essential part of their devolution. British municipalism showed the way to the rest of Europe, even though it was derided by both conservative and socialist opponents ('water and gas socialism'); it was a form of maintained or renewed community level of management in a country dominated by liberalism and State regulation. Most of the water industry was municipalised. And the equity principle was often mobilised by the government to allow cities to take raw water in contradiction to the riparian rights principle. In the

twentieth century, the growth of demands due to urbanisation and industrialisation, and growing pollution, made concentration of water services necessary between both world Wars, at a time when increased government intervention in the economy implied to take back tasks that had been devolved to local authorities. The alarming state of rivers led to the creation and development of river boards to advise the government and to introduce river basin planning. Finally, in 1974, all the various aspects of water policy and industry were integrated in the 10 Regional Water Authorities (RWAs) which covered each a group of river basins, and where the role of local authorities was finally reduced to nothing. The issue of having water regulation enforced by government Quangos which also were the water industry, i.e. the major polluters and abstractors, was at first overlooked, within the general confidence that rational management had to be done at a (regional) government tier where local elected representatives could not limit the search for technical efficiency (Saunders, 1983). In the end, the adoption of the river basin as the essential level of water policy can be considered as both a centralisation and a technicisation move.

British evolution has thus very well characterised the ideal model that international organisations were promoting: rational management at sub-government level, but away from local communities; it received criticism of authors claiming that water planning was political and not only technical (Parker and Penning Rowsell, 1980). Others argued that water engineers preferred to invest in infrastructure which the decline in water demand made not so useful, while soon afterwards the austerity put on government spending made it impossible for the RWAs to meet their targets. Then they were increasingly criticised for being both the poacher and the game keeper. It was the time of the 'conservative revolution' in the United States of America and in the UK, and privatisation was felt as the solution, in particular by the managers of the RWAs who thought that it would allow them to borrow the money that they could not have as long as they were quangos. Again the historical centralisation allowed Britain to introduce a coherent set-up, with a private but concentrated water industry, and a central government regulation. The 1989 privatisation has been popularised as being fairer since more efficient, as if central or local public water management was bound to be inefficient. For most careful observers however, the recent privatisation of the industry has been associated with increased centralisation, since the new regulators for various aspects of the industry (OFWAT for quality of service and price, NRA and later Environmental Agency for environmental standards, DWI for drinking water quality) are clearly located at central level. Britain ends up with the most centralised system of water management in Europe. But there are still river advisory boards where water users can express their opinion about water policy. Consultation of the public also takes place within the Local Environmental Action Plans (LEAPs) which are meant to integrate various environmental aspects. Consul-

tations remain largely informal so it is not easy for foreign observers to evaluate their importance.

4. The French case

In France also, there are River Basin Authorities, but the famous *Agences de l'eau* have a very different policy meaning. If we go back to the French Revolution of 1789, it is clear that the outcome was an institutional set up built on the confrontation between the State and Private property, which left little room for community levels of management. However local communities, i.e. parishes were kept, and transformed into constitutional 'citizens' societies', with general police powers and also specific tasks, including delivering drinking water. The outcome of the evolution in the course of the nineteenth century was that if the central state had most of the sovereignty, the commune also had an important degree of sovereignty, as being the assembly of free citizens at local level. Many of the duties of local authorities are constitutional and not devolved like in Britain. Therefore, there can be no fusion or reorganisation of water services forced by central government. In a context of slow industrialisation, and relative abundance of water, this explains how still today, France has the largest number of undertakings in the water industry in Europe, with both very large ones and very tiny ones, and many joint boards between communes. As we'll see later, it also explains why large private companies have developed in the water sector.

In the twentieth century, increased intervention of central government in the economy ended up in a system described as 'cross regulation' by political scientists (e.g. Grémion, 1976), i.e. a system where central government has economic and technical legitimacy, but where local elected representatives are the aldermen and retain political legitimacy. It has been shown how the resulting decision making processes were non transparent, and not much in favour of the protection of common goods. Implementing environmental regulations for instance, would lead to bargaining where local politicians would ask Prefects to bring subsidies, or to accept local pass through. River quality was dramatically declining after the second world war, in a context of rapid urbanisation and industrialisation. The civil code had defined private waters and public waters, but, according to Roman law, non domanial rivers had always remained a common property of their riparians. Yet the river boards which should have become general after the framework 1898 law never really developed, and there was no institutional level to handle water resource issues. In the 1960s the Gaullist regime sought to modernise government action through regionalisation and planning, and to transform the modes of civil society's participation, in favour of

present-day economic forces, and at the detriment of the traditional representation of rural France via the *Conseils généraux* (boards of the *départements*) and the Senate. It is in that period and in that spirit that the 6 Agences de l'eau were created, as a sort of tripartite contract between State, local authorities, and other stake holders (industry, agriculture, hydropower, etc.). Based on groups of river basins, they operate under 5-year programs which are proposed by their executive boards and voted by the river basin council, under the supervision of both ministry of the Environment and Treasury. They also vote the levies which each category of users will have to pay so as to fund the investment program at a rate between 35 and 45%. The number of Agences (6) is a compromise between hydrographic constraints, efficiency depending on size, and also the desire not to break the constitutional principle of equal opportunity: the agences' levies are taxes and in a centralised country, the same pollution should be charged the same tax everywhere, despite hydrographic difference. The compromise found is that a levy over a new item of pollution discharge or water flow regime modification (e.g. impervious surfaces) can only be created at national level, but the rate of the levy is chosen by the basin councils.

In 30 years existence, the Agences have evolved with less and less direct government implication, and increased community spirit between water users. So that they now appear as decentralising institutions (while initially they were seen as a Trojan horse against local authorities in water policy), and as the only real example of subsidiary institution (i.e. where decisions are made by a community of users who are different from each other). This makes French water policy closer to those in other continental European States. However, subsidiarity remains in principle at odds with the French constitution: the principle of equality between citizens implies that the Nation can adopt a derogatory status for a region, and also a special tax system, but the Region itself cannot vote its own laws or taxes which are not part of the national set up. Then the status of the Agences remains fragile in terms of legitimacy. In particular, the Agences have neither regulatory powers, nor the right to build and operate by themselves the needed infrastructure. These tasks remain with central government or traditional territorial authorities. Some opponents have also accused them of being unconstitutional, since their 5-year budget is not reviewed by Parliament and does not go through the Treasury.

5. Countries with subsidiarity

In comparison with centralised England and France, other continental member States appear as much more organised under the subsidiarity principle: if a local level of administration is efficient, there is no basis for any upper level to recapture its tasks.

This correlatively implies that it was unlikely from the start that river basin institutions would be generalised, because it would need critical situations. When there are water management problems at any territorial level, usually a working party between concerned institutions will be set up. New institutions are eventually created on a voluntary basis by actors of that level.

In the Netherlands, the old *Waterschappen* (waterboards) going back to the Middle Ages are communitarian institutions: their boards are not elected in general elections, but made up with representatives of various types of users. They have survived and developed, and they even resisted Napoleon's decision to turn them into purely administrative institutions; they eventually were generalised to cover the whole country, but under affinity principles rather than geographic (there are no marked river basins in the Netherlands, which are partly below sea level!). They are so important that they are now in the Dutch constitution as functional local authorities, with some regulatory powers, planning powers and building/operating powers. Of course, due to increased complexity of water management (in particular, the quality or pollution problems on top of traditional drainage, flood control and navigation problems), they have undergone a strong concentration process: more than 2,500 at the end of the Second World War, less than 70 today. But all of them do not cover all the tasks of water management; in particular, drinking water is not supplied by the *Waterschappen*, but by joint boards of municipalities, and increasingly by private firms owned by local and regional authorities together (formal privatisation). When they decided to turn to integrated water management around 1985, the Dutch decided that the appropriate territorial level for the coordination was not the State (despite the strength of the Rijkswaterstaat, Water Direction), but the 12 *Provincies*, which are anyway responsible for all groundwater policy. With the undergoing concentration process, there may be a continuing merger of Waterboards, and a merger of these with drinking water supplies, at regional or sub-regional level. In the end there would remain only one or two all-water services and resources institutions for each of the 12 provinces.

Belgium has evolved into a federation where water management is devolved to the three provinces, Flanders, Wallonia and the Brussels capital area. They do not exactly correspond to the existing river basins, but the Meuse is almost all in Wallonia, and Schelde is largely in Flanders. Belgium is an interesting case since most of its surface water, and one large aquifer at least, are international (see below).

Germany offers a very interesting case, since it not only has the largest and the wealthiest economy in Europe, but also is a federal government. The *Länder*, not the Federal government, have the most important responsibilities in water policy, and local authorities, or rather cities, retain important powers in the service provision. Federalism (which was reinforced after the second World War), and also the fact that

most German rivers are shared with nine neighbouring countries, prevented the rise of basin institutions. There are however a great number of 'water and land' associations like in the Netherlands or in Denmark, which often are small neighbours' associations, operating drainage, flood protection, and even sometimes water supply, at infra-municipal level (which is surprising to the French or the British). In one famous case only were these (private law) associations transformed into public basin institutions: it is the Ruhr *Genossenschaften*, which served as a powerful model for other countries, in particular the United States of America and France (Kneese and Bower, 1968). Their emergence between 1898 and 1912 is not solely due to the extreme industrial pressure on the environment, but also to the need for the Westphalians to set up community forms of management (and also for other infrastructures), with the support, but not the direct control of, the Prussian empire at the time (Korte, 1990). But it is worth noting that the model was not picked up by the rest of the country. It seems that even the Nazis could not take their water responsibilities away from cities. Today Germany has to adapt its water management to the creation of hydrographic districts by the WFD, but it will probably favour a co-ordination formula rather than a supra national authority.

The situation is similar in Austria, with federalism, but with fewer problems due to the alpine situation and the corresponding water endowment.

In Nordic countries, there have been discussions to create a river-basin level of management, but here again, traditional subsidiary approaches prevailed, in a context where water is particularly abundant (Finland, Sweden, Norway), or essentially located underground (Denmark). Regional administrative levels of government play the major role, but there exists eight and three water tribunals respectively in Sweden and Finland, following river basins contours; they settle allocation disputes between hydroelectricity and other users. They may be transformed into hydrographic districts for the sake of implementing the WFD, but it is not sure.

6. Mediterranean countries

Now looking at the south of Europe, it is essential to note that important water policy changes took place in Spain, Portugal and Italy, in periods of dictatorship. The importance taken then by the modern and rational State insidiously led to considering things in common use, like water, as public domain; also dictatorships have interpreted the subsidiarity principle conversely to Northern Europe, i.e. in a top-down manner. In particular, Portugal and Italy, like the populist movements in Latin America, decided that elected local authorities were unable to fulfil their tasks and had to be replaced by nationally organised corporatism. This is also why today, there

is a converse and strong attachment to elected local authorities and to their role in water services provisions.

In Italy, there was intense rationalisation under Mussolini (in particular with the *Testo Unico*, or framework law, of 1932). However, there were no basin authorities formally created. Like in France, there was considerable industrialisation and urbanisation after the Second World War, and the need to better co-ordinate water policy at some form of regional level was clearly felt in the 1970s. But the river basin was not chosen. Rather, new prerogatives in water planning were given to the twenty *regioni*, which were at the time the privileged locus for both rationalised and decentralised policies. But the corresponding Merli law of 1976 was poorly enforced, and in 1989, in a law devoted to control floods, landslides and erosion (which are crucial threats in Italy), it was decided to develop a river basin type of authority. Most river basin boards are under the authority of the regions where they are located. A few *Autorità di Bacino* depend on national level for those rivers shared by more than one region. The latest law (the Galli Law of 1994) proposed to rationalise the water services industry at supra local but infra regional level, and under 'optimal' (originally catchment-based) territories (the *consorzi idrici*); however, the discussions might end up with the creation of 80 to 100 water services institutions not related to hydrography. Which again shows there is no systematic overlap between resources and services management. Concerning resources, there is indeed some hesitation between traditional administrative and river basin territories.

In Portugal, under dictatorship there were large hydraulic projects like in Spain (see below), and to carry them out water administration was similarly organised at the level of four or five groups of river basins: *circunscrições hidraulicas* integrated in a centralised directorate. But the corresponding structural measures were realised slowly, for lack of money. After the 1974 return to democracy, local authorities' powers were confirmed, and conversely, the idea of creating river basin authorities was resented as being technocratic and too close to the former regime. The creation of administrative regions has also just been discarded after intense debates. Portugal is a rather small country, where local authorities are quite large, so that the creation of another tier of government appears artificial, and even to some as a formal tuning to the European Union. In 1997 it was finally decided to develop water planning at the level of fifteen river basin councils. It remains to be seen how these councils and plans will retain institutional importance. Conversely, Portugal managed to convince the European Union to fund the realisation of the largest reservoir in Europe, Alqueva at the frontier with Spain. It is a controversial project for both economic and environmental sustainability reasons.

In Greece also, there is hesitation on the appropriate forms of water governance: since the early 1990s there are fourteen river basin institutions covering the country,

for the purpose of studies and planning the sharing of water between hydroelectricity and other uses, but water policy is run at the level of administrative regions created in 1987, and of traditional prefectures, in a traditional complex sectorisation and overlapping between levels of government.

7. The Spanish case

Spain is one of the most fascinating countries in the sample, because it has a breakdown of water demand with 80% from irrigation. This is not different from Italy or Portugal or Greece, but more extreme. Spain is also the first member State of the EU to have been systematically covered with river basin institutions. This is the outcome of an old nineteenth century project basing social 'regeneration' on the development of irrigation, i.e. in this Mediterranean country with irregular river flows, on large hydraulic schemes like reservoirs and water transfers. The moral crisis which followed the loss of the last colonies in 1898 was the triggering factor of a plan for food independence with irrigation, which would help small peasants to stay on the land without claiming for agrarian reform. Projects of recolonisation of the interior were prepared earlier, but the first *confederación hidrográfica* was set up in 1926 on the Ebro river basin, by dictator Primo de Rivera. The Spanish Republic first considered dismantling it, but it finally maintained it with the creation of a users board. Conversely, General Franco suppressed the board, gave full power to engineers, and generalised the principle of 'water bureaucracies' to the whole country. Systematic harnessing of water resources allowed to increase the low flows, and even to transfer water from the Atlantic basins to the Mediterranean ones. However, the amount of water really available is still inferior to what was hoped. Besides, this policy has generated an unsustainable race between demand which uses the average quantities available, and supply, which tries to satisfy demand even in the driest years. All this in a context where surface water from large schemes is given rather than sold to farmers, i.e. with no incentive to conserve. Transfers have generated increasing levels of conflict between regions of Spain, and with downstream Portugal (Mezo, 1995; Vergés, 1996, 2002).

After the return to democracy, the power of the basin institutions has increasingly been challenged by the rise of the Autonomous Regions, which represent another level of subsidiarity. Besides, the framework law of 1985 has reintroduced water users in the boards of the Confederaciones, and has proposed to generalise local water management by users boards set up under the model of the old Valencia tribunal, and of the much more recent and significant community of groundwater users in the Llobregat delta (close to Barcelona, which was successful in stopping over-

exploitation of the aquifer). So that there is both extreme centralisation and challenge by more subsidiary and common property based approaches. The preparation and adoption of the National Water Plan (*Plan Hidrológico Nacional*) is generating intense controversy, in particular as concerns projected generalisation of water transfers. Clearly, there is a policy system in tension between various levels of government. In 1999 a law allowing for the development of 'water markets' was voted. Abstraction rights holders would be allowed to sell their right to other users having a similar or superior priority order on the resource. But this law is poorly implemented, because water engineers seem to be reluctant to develop this form of demand side management.

8. Analysis in terms of water ethics

If we try to sum up the different cases covered here, it is possible to propose a double-entry typology: first countries where water law derives from Roman law vs countries with Germanic customs as water law origins; second centralisation vs subsidiarity. Germanic and centralised is Britain, Germanic and subsidiary are most of the other northern Member States; Roman and centralised is Spain despite recent evolutions, while Roman and subsidiary is more like Italy and to a lesser extent Portugal. France ends up in a paradoxical situation, since it should be Roman and centralised like Spain, but the Agences de l'eau are subsidiary institutions. In fact it can be shown that all Member States of the European Union combine the reinforcement of Government authority on water uses and at the same time the development of water communities to reduce transaction costs in the allocation of water resources. This position is summarised in the following table.

<i>Primary roots of legal system</i>		
<i>Administrative tradition</i>	<i>Roman</i>	<i>Germanic</i>
Centralisation	Spain	Britain
Subsidiarity	Portugal Netherlands	Italy Germany

In the table France should have been with Spain, but with the Agences de l'Eau, and later the notion of water as common property, has moved closer to the Netherlands.

Another striking fact derived from these various case studies is that private waters, which were recognised under liberal nineteenth century States, are losing importance

everywhere. In Northern member States of the EU, the ownership rights had never entailed freedom to use and abuse. This was more the case in Latin member States of the EU, at least as concerns groundwater. Yet, Portugal (with a series of regulations developed in the 1970s and 1980s), Spain with the 1985 law, France with the 1992 law, and Italy with the 1994 Galli law, all have placed all waters in the 'public domain', whichever their appropriative status. This implies that water uses are subject to licensing from government. In France, the precise wording of the law is 'water is part of the Nation's common heritage', which means water is not owned by the State, but subject to uses regulations by the State. The prefect in charge will base its implementation of the regulation upon a SAGE, i.e. a catchment plan, if a *Commission locale de l'eau* has been set up and has realised such a plan. Otherwise he will refer to national regulation which is increasingly unified. It is less clear in the other countries, but anyway, and conversely to what is widely discussed in world organisations under the influence of the western United States' experience (also controversial cases like Chile), the confrontation between public and private is being replaced by another confrontation in Europe, between public regulation on the one hand, and common property based forms of governance on the other.

Analysing communities' role in economic history, and also presently in developing countries, Ciriacy Wantrup and others showed how the common property approach could provide helpful solutions for present-day problems of natural resources policy. He concluded with a proposal to differentiate common property in public trust and public property: 'Some legal scholars even maintain that the public trust doctrine is really the common lands concept, which has and continues to express communal interest and right to land resources. For purposes of natural resources policy, such public trust resources must be differentiated from public property resources. First, legal restrictions on disposal of trust resources and on changes in their uses are more stringent than on public property. Second, resources under the public trust doctrine are subject to government regulation without the legal obstacle of 'taking for a public purpose' and therefore without involving the issue of compensation'. This is illustrated by the famous United States of America case of 1966, *Just v. Marinette county*, as analysed by Banta et al. (1973): easements imposed on individuals for the sake of environmental protection cannot be considered as taking of property for a public purpose. This case was followed by many others, including the Mono lake dispute. Yet, obviously, the public trusteeship doctrine will be better accepted if citizens face a guardian-State rather than a master-State, following Stefano Burchi's expression (Burchi, 1991). It does not mean no role for the State, but a balanced set up between government and Community-based institutions at regional or basin level.

Anyway, it should now be clear that the concept of common property is appropriate

to deal with the issue of water rights, even if it needs to be refined from a strictly legal point of view. This should be done by lawyers. One could for instance wish to derive from scholarly legal and historical analyses (e.g. in France, Maurice Bourjol's *Les biens communaux* of 1989) appropriate legal solutions for these new 'commons' made up with an increasing number of surface and groundwater catchments.

What can be derived from the European recent experience is that the category of waters considered as common property, held in trust by the States, but managed at more adapted subsidiary levels, is not at all declining but gaining momentum. Private waters (i.e. waters attached to landownership rights), but also domanial or public waters are in fact declining categories. The public vs private debate is becoming obsolete in the field of water rights, as it might also become in the field of water services delivery (Barraqué, 1992).

To illustrate this, let us consider the abstraction and pollution charges in France. The Agences de l'eau have been popularised by environmental economists as an example of implementation of the polluter-pays principle, which in theory aims at internalizing the external social costs in the market economy; the outcome should be a reduced need for State control and intervention: economic incentives would replace licensing and policing. In fact, the Agences de l'eau were created before the invention of the PPP, and they much more follow the German or Dutch basin solidarity approach. Further, the French system was set up in a context of weak enforcement of water regulations, but it supplemented rather than replaced them! Charges were not raised to the level where the economic theory says that polluters would stop to pollute, but only to the 'solidarity level': through the level of charges they jointly accepted, water users of each administrative basin agreed together to give compensation to the community for the damage they provoked, and the money is employed for funding those willing to lower their impact on the water quality or quantity. The outcome of this policy, considered at first negatively by the polluters, and also by the ecologists who contended that polluters would purchase the right to violate the law, is paradoxical: it made the water users conscious of their responsibility in the degradation of water quality, and of their solidarity vis-a-vis the water in the basin, so that now it is easier to enforce the regulations.

The 1992 law makes all waters part of the common heritage of the Nation, and generalises a permit system for all abstractions and discharges in the hands of the central State. Participation at basin level has made better regulations possible at national level. In particular, it has been finally enacted that pollution is an offence *per se*, and not only if it occurs in violation (i.e. in excess) of a discharge permit. This illustrates an important fact, too often overlooked by economists: in complex policies involving a great number of actors like water, transaction costs are usually too high for a rational and centralised regulation to be efficient. The regulator usually does not

have the information needed from the regulated to do his review. Then it is impossible to avoid the need to build up confidence between water users so as to obtain their willing supply and sharing of costly information, thus making things manageable.

In all European countries where economic incentives are used, they supplement regulations rather than replace them. When the management of the charging system is under control of boards of users, there is periodically a public debate on the sharing of the resource and the associated costs, and the charging system acts as a tacit compensation mechanism. This is very important, since discretionary powers granted to central administration services to give permits and to enforce them are not always used in a neutral and impartial manner. As case-studies of Integrated Pollution Prevention and Control systems in England and in France show (Lascoumes, 1994; Hawkins, 1984), there is indeed possibility of a capture of the regulator by the regulated, via the technical mastering of complex industrial processes, and because administrations in charge of the control are also in charge of supporting economic development (in France).

There is however an important and contradictory finding in our analysis. Water boards may be more efficient than governments, but they must be checked by them, and this for ethical reasons. It is impossible to leave boards of water users manage their catchment by themselves: first, the State, in democratic countries, must ensure that equity and even equal treatment between the users of the resource is maintained. As illustrated by the English system, common law has long been checked by the 'equity' courts system. Du Bois (1994) as well as Ciriacy Wantrup also points out that customary arrangements to share the use of the commons are not necessarily democratic. In France, for the very reason that the Agences do not have the same degree of sovereignty as the Parliament or other elected councils, they cannot create new levies (for instance on stormwater problems generated by soil imperviousness) by themselves: equality of all French citizens vis-a-vis the law, and democratic review of all taxation, requests that the creation be made at the national level, by a vote of the Parliament; the Agences having the secondary right to raise or conversely to lower the charges level. Second, State intervention is also necessary to introduce, in any sharing system of common property, priorities generated from outside, for the sake of solidarity at other territorial scales. The most dramatic example is water transfers from basin to basin. Such policies can only be developed by sovereign institutions since they alone have the right to use and abuse (*ab-utere* in Latin, literally take away) the natural resource.

Thus, the modern system of water administration in most European countries can be basically sketched as a tension between two competing/complementary trends: generalisation of major policy choices, and of discretionary permit systems at State

level, with however harmonisation at the European Level; and generalisation of water users boards and of local planning at catchment or other forms of appropriate subsidiary levels. Strikingly enough, the only three countries fully covered with river basin institutions are the three centralised monarchies (France, England and Wales, Spain). Yet their institutions are very different: subsidiarity and solidarity, regulated market, government hydraulics. Because water users are increasingly diversified and numerous, water management has to balance between top-down planning and mediation of various users' interests. In this process, as pointed above, the legitimising principle is moving from appropriation or ownership rights, to usership rights, which make it easier to reach compromises. This is what was at stake in the preparation of the Water Framework Directive in Brussels. The European Union is however particularly concerned with international rivers.

9. International rivers

As long as there is no strong international legal system to share water resources, States are theoretically sovereign on water which flows in their territory. However in the case of shared rivers, sovereignties conflict. Downstream countries are tempted to refer to a strict riparian rights principle: exploitation of water by upstream countries must leave quantities and even qualities untouched. This is the position of Egypt concerning the Nile. Conversely, upstream countries tend to refer to the absolute sovereignty doctrine. The Turkish government for instance claims that water of the upstream Euphrates and Tigris is due to rain in Turkey, and thus water is its property. They claim they are kind enough to let a minimal average flow of 500 m³/sec for downstream countries. There are other examples of the kind, in particular with the Chinese government's refusal to participate to the Mekong River International Commission (China holds all the upper basin, and has huge hydraulic schemes). In the United States of America the so-called Harmon doctrine opposed to Mexican claims over the water of the Rio Grande is in the same vein. But this doctrine, as well as riparian rights, are increasingly being challenged by a principle of 'reasonable and equitable use'. However countries like Syria, which are both upstream and downstream do experience the contradiction between a sovereign attitude and riparian rights.

This principle of reasonable and equitable use was developed by the international association of water lawyers, and has resulted in the 1997 New York Convention on the equitable and reasonable non-navigational uses of international watercourses (Da Silva et al., 1998; Della Penna, 2000). It clearly limits the sovereignty of each of the co-riparian States on the water crossing their boundary. The convention was approved by a massive majority of 104-3, and is in the process of ratification by

States. This important outcome is based on a certain number of precedents. One of the best examples is the United States of America-Canada international commission, made up with three representative experts on each side, the decisions of which cannot be appealed by either government. But there also is an important development of shared international river basin management in Europe, with the progressive opening of older international navigation commissions to integrated water management issues. The best known example there is the Rhine commission (ICPR). There are several historical accounts available (e.g. MFA, 1998), but it is clear that the success is due to mutual recognition that concerned States must respect each other's point of view, and abandon any unilateral claim to sovereignty on water. It also seems that things were made much easier when central or federal governments let subsidiary levels of management tackle the issue together (i.e. the concerned German Länder and Swiss cantons, federal provinces now existing in Belgium, French Agence de l'eau Rhin-Meuse ...). Based on this experiment, the Meuse experiment, and North Sea common policy, the ethical issue on institutions can be summarised in eight statements (MFA, 1998):

- Only voluntary decisions of riparian States create the appropriate conditions for sustained international co-operation;
- One-sided promotion of individual or sectoral interests negatively affects other interests and may cause considerable harm to the entire ecosystem;
- Beneficial transboundary co-operation requires mutual trust. Concrete measures may confirm common intentions. This process takes time;
- Disasters with international impacts are excellent occasions to improve the transboundary co-operation;
- Harmonisation of measures must not be limited to river basins but should also include the recipient sea;
- Legal frameworks help to tackle transboundary problems and to structure common activities;
- Common elaborated monitoring infrastructure considerably contributes to mutual trust, joint assessment and policy making;
- Periodical assessment of plans gives the opportunity to adapt and modify objectives and measures to changing conditions and opinions.

It remains to be seen whether the progress in the European Union will help generalise the common property approach to other international river basins, where there are still water conflicts, like between Spain and Portugal. In the dictatorships period, which was also the time of great expectations from hydraulic projects in the world, there was a sort of tacit agreement that both countries would build a number of reservoirs to catch as much fresh water as possible before it runs into the sea. However, Portugal now realises that the Spanish systematic damming makes it in fact

more difficult for itself to fill its own reservoirs (Llamas, 1991, 1992), but also forces its own realisation of more projects. In this respect, the Alqueva reservoir on the Guadiana just after the border with Spain, which is the largest in Europe, is a model of this contradiction: in order to obtain sufficient water from Spain to fill the reservoir, Portugal had to accept a convention whereby Spain can develop more hydro projects on the two other shared rivers, Douro and Tagus, while cost-benefit economic analyses of Alqueva itself are not good (Vergés, 2002). The European Union is involved, since it has paid 60% of the project costs through regional and cohesion funds. In the Commission and in the European Investment Bank, and even in Portugal itself, there is growing criticism of subsidies to a wrong supply side policy, which contradicts the very spirit of the Water Framework Directive (proposed full-cost recovery). But the change to more sustainable policies is difficult to obtain from their upstream neighbours, for reasons which have already been given above.

There is also a project to transfer water from the mighty Rhone to Barcelona, which has unfortunately drawn some inconsiderate enthusiasm in the European Parliament. The project indeed attracts sympathy because of alleged international solidarity, and besides it would probably have no serious effect on the environment. However, Barcelona probably does not presently need the quantity of water that would solely justify the transfer. Whatever the real need for water may be in Barcelona, and the possibilities to satisfy it from closer sources of water, there are fundamentally two opposite positions: some argue that water is owned by French government, which can authorise the Rhone aqueduct company (holder of a concession right) to sell it to its Catalan counterpart, provided a treaty is signed with Spain. But conversely, one can argue that water should be managed at the level of the basin, and that one should seek transfers from outside only once efficient and rational management possibilities have been completely developed inside. Lastly, some argue that such a transfer from the Rhone necessitates the agreement of the Swiss ... Again, this is the spirit of the EU Water Framework Directive 2000 (WFD) concerning all hydrographic districts, including those shared with non member neighbouring countries. Thus, together with the evolution of domestic water rights and water resources allocation, the development of the European Union will modify traditional sovereignty attitudes towards subsidiary and sustainable approaches.

In the preparation of the WFD, some observers of the Mediterranean countries advocated that the quantitative issue should be explicitly covered, to tackle the unsustainability of the inconsiderate irrigation development. In the final document, only groundwater quantitative status is mentioned, but other provisions, like quality of ecosystems and incentive tariff systems will lead to placing the supply sided quantitative approach of the engineers under scrutiny.

10. Ethical issues in public water services provision

Public water services, i.e. drinking water systems, and centralised or decentralised sewage collection and treatment, are now technically mature industries, but they raise two different problems: in developing countries, the issue is how to set up the initial infrastructure at affordable costs for the population, in particular in low income areas. In developed countries, where the infrastructure is completed, a new issue is arising: how can we maintain this infrastructure in good condition?

Even more than in the water resources sector, there is an intense debate going on, under Anglo-saxon influence, about the privatisation of water services. Private management would be more efficient than public, and it could also accommodate ethical principles with the notion of universal service: for equity reasons, all public services should be provided at no charge or cheaply up to a minimum quantity. Only consumption above this minimum level should be covered at full cost. This definition of universal service is quite different from an older definition of public services which prevails on the European continent, according to which all citizens should be charged equally for the service. The charges should be all the cheaper that infrastructure is part of public economy, in which case investments should be covered by public money (taxes) and not by service charges. The latter should correspond only to operation costs, i.e. short term marginal costs. In some developed countries, a modernisation has taken place with the development of metering and billing of operation costs plus a share of the investments reproduction.

This international debate between private or State provision of services, here again, tends to skip the specificity of the continent where networked services have been invented, Europe. The history of infrastructure is in fact the history of what we can call municipalism, which is indeed something different from both private and State, and which is of particular relevance for water services which are usually local services.

In fact, in many European countries, municipalities are the modernised and democratic version of ancient bourgeois or peasant communities, so that they often have a specific legitimacy (on the double register of *Gemeinschaft/Gesellschaft*). Besides, they have been involved in local welfare procurement a few decades before the development of the welfare State. Following the British 'municipal socialism' example, at the end of the nineteenth century, they took over the management of public infrastructure (water, gas, transport) which had initially been installed by private companies. The latter at the time could not succeed, because they had only moderate

support from banks, and therefore had insufficient capital to cover anything else but the wealthiest neighbourhoods, and then sell the networks to local investors so as to go on to the next city. This was unsustainable, since local investors had little capacity to maintain the services, and since health and welfare of all citizens would be threatened by absence of sanitation in part of the city. When they took over, municipalities could use the growing deposits in local mutual savings banks which they often controlled, so as to fund the generalisation of infrastructure with cheap money, and at depreciation rhythms corresponding to the long life time of systems. In cases where local authorities had little or no access to savings banks, like in France for centralisation reasons, the government developed subsidising schemes. All this resulted in greater sustainability, because the services prices could be lowered thanks to economies of scale, but for the same reasons the operators earned much more than when they serviced only the rich. It is thus a whole system based on solidarity and mutual confidence in the long run, which is still dominant in practice in European municipalities. As a matter of fact French father founders of the Solidarity doctrine often used hygiene and epidemics to justify redistribution of the riches' surpluses to local welfare improvement schemes.

However, municipalism ran into crises. The first one is linked to economies of scale: if very large cities have no problem to invest in new supplies or extension of sewerage, small cities have much greater problems, since the impact of investment is heavier on their populations. And low density areas, in the countryside as well as in far out suburbs, alternative and decentralised technologies may be found preferable in terms of cost-efficiency ratio. The second historic crisis is the external effects on the environment: urbanisation and industrialisation have serious impacts on aquatic ecosystems, as well as on the quality of water to be made safe for drinking purposes, which in turn imply sophisticated treatment and higher costs. In countries where sewerage is charged through the water bills, it is understood that full cost pricing will sooner or later bring sewerage prices in the order of the double of those of drinking water, i.e. will imply, and already does imply, a serious increase in prices. This is not necessarily understood by citizens. The third issue is the need to replace ageing infrastructure, but with no more subsidies or cheap money, which also pushes prices upwards. Then we come to the most important crisis of municipalism: its historical incapacity to consider demand side solutions.

Because the initial movement consisted in providing to all what only the richer could purchase, municipalism was obviously supply-sided. And if, on the one hand, providing the best drinking water for all uses without distinction in unlimited quantities allows for economies of scale, on the other, it induces irrationality among users, who forget everything about the system except for their taps which should run whenever they need it. And they don't pay attention to what they pour into the sewer.

As has been said about solid waste, 'out of sight, out of mind', and 'NIMBY'. Operators usually had no idea of what people do with drinking water, they had no sociological or marketing knowledge, and they were just satisfied that water demand was always rising everywhere, so that ever-expanding systems was their sole reference. This is still largely valid today, and by the way Barcelona region's water supplier fancied to build an aqueduct all the way from the Rhone, on the basis of a large population increase, and of a per capita demand increase, both of which are unlikely to happen. Yet, as in most European cities and even in many rural areas, drinking water demand is not going up anymore, but down, for the first time in history. This is indicative of the need for demand-side management, which is now starting in several countries. But there have been other, more ancient and various answers to the crises, which we wish to summarise.

11. Answers to municipalism's crises

These answers have first been found within the supply-side approach, and they are already quite ancient. In fact, privatisation is not the only answer, in particular since all the limitations we have mentioned above are not specific to direct labour service provision. In France for instance, giant water companies are really in no different situation from the *régies municipales*, except that they have more financial means, technical skills and flexibility to face new situations. What happens most of the time, is that privatisation, or delegation of the services to a private operator, occurs not for positive reasons, but because public procurement could not face important investments, or because local elected representatives do not want to appear as being directly responsible for water prices increases, which would occur anyway.

Most of the answers found in Europe are in fact based on averaging out or 'equalisation' schemes to limit the impact of heavy but long lasting investments. The first scheme, of course, has been and still is concentration of services, like making joint boards of municipalities; larger undertakings also allow to retain qualified personnel. This process typically occurred in the Netherlands since the Second World War. Concentration may end up in centralisation, if the government decides that the local level is not the appropriate subsidiary level any more (England and Wales, possibly Italy, plus many developing countries, like Brazil and Argentina in the 1960s). But it can also occur via privatisation, for a large private group can end up managing water in large areas through several contracts with single towns or joint boards. In Mediterranean countries, the variability of the climate has led to the creation of public regional companies in charge of transferring bulk water to urban or irrigated areas. These schemes are heavily subsidised, so that local utilities do not

face too high prices. This does not necessarily promote water conservation as illustrated by the Italian Mezzogiorno, where water abstraction is up to 500 lcd (litres per capita per day, three times the average in Europe), but with very important unaccounted for water losses (average 58%). In Portugal within the confrontation/co-ordination between central and local government, it has been decided to keep the municipal service provision. But, in the 5 largest urban and industrial centres, mixed economy companies have been set up between central government (50%) and municipalities to build and manage the needed water transfers and hydraulic projects. This is a more flexible choice than was decided in Italy after the Galli law.

The second possibility is transversalisation, and it consists in managing urban services together, through the same public or semi-public company, so as to pool the financing needs, thus indirectly lowering the cost of money. It also allows reduction of another important cost, which is the billing or charging process. In many countries, this is the rationale for pricing sewerage together with water in the drinking water bill, but in some countries with historical economic autonomy of local authorities, like Germany or Switzerland, transversalisation extends to several urban infrastructures like gas, transport, electricity distribution, eventually cable TV and telephone. The best example is the German *Stadtwerk*, and it is unfortunately overlooked by international organisations, which tend to prefer regional private operators, for fear of local corruption, and for general economic theory reasons (see Briscoe, 1996, and the answer by Barraqué, 1997).

The third answer can be called temporal averaging out, and it is precisely based on lowering the cost of money for the investments. Compared to the 1960s and 1970s, inflation rhythms have been going down, which make borrowing more expensive in fact, particularly in the long run. Besides, in the most developed European countries, government subsidies, which were massive at the time of initial infrastructure construction, have been reduced or suppressed. Subsidies are a sort of financial averaging out over a long period of time.... Then water services operators are bound to develop other forms of temporal equalisation: better depreciation schemes, provisions for renewal of ageing assets. This is also a reason for privatising, at least formally by creating a municipal enterprise, in countries where public accounting doctrine limits the possibilities to depreciate. In France, one of the keys to the success of the water groups was the constraints placed on public services accounting by the Treasury. Since investments are still mostly done by local authorities, which can get access to specific loans with cheaper rates, the formula developed in France was privatisation by delegation (lease and management contracts): conversely to the British case, the huge amount of infrastructure installed over the decades, remains almost entirely in the possession of public authorities. It is just the operation, the maintenance, and eventually some renewal of electromechanical parts, that is

privatised; but the accounting is private, which allows the use of modern depreciation and provision schemes. Another solution for temporal averaging is to pool the provisions at an upper tier of government or territorial management, where they can obtain better rates: one can think of the Dutch Waterschapsbank, of some French Conseils généraux (at *département* level), and of course of the French Agences de l'eau. The latter levy abstraction and pollution charges (which are taxes), but the funds are entirely made available to all those willing to invest for the sake of environmental or sanitary performances of their infrastructure, partly through subsidies, and partly through zero interest loans. Because the system is based on mutualisation, the French Agences were criticised by economists and others for sustaining an inefficient allocation of funds within a supply side approach. The Treasury and some Parliament members also criticised the impact of the levies on water price increases; however they facilitated the making of very important investments in a sustainable manner, and in fact the system increases short term water prices for the sake of lowering it on the long run (Barraqué, 2000).

From the presentation of these three types of answers, one can derive that in water services, what is expensive is usually not water, but money. In Northern Member States of the European Union, infrastructure has been fully developed thanks to government subsidies or local taxes. Now it is possible to cover all the costs with water bills, because initial investment is considered as fully depreciated, while having still some life expectation ahead. The major problem is that we don't know yet how much should be invested per year to reproduce this enormous amount of capital: if they would rebuild all of it today, the British would have to spend 270 billion Euros, and the French 230 (rough estimates). How much should be invested per year is still difficult to answer, since there is in fact an overlap between renewal of ageing assets, new investments for the sake of service quality or the environment, and also maintenance (which can indeed extend the lifetime of assets). The largest issue is whether citizens, and their representatives, will accept the price rise involved with sustainability, without losing confidence in the operators.

In Southern European countries, the ethical issue is different, since the initial infrastructure is not completed yet. Then if they adopt the full cost recovery principle, and phase out government subsidies, water prices are going to raise tremendously, and become socially and politically unacceptable. Northern European countries are in no position to give lessons, since they had subsidies during the initial development period. Why should other countries not do the same, if it has proven sustainable that way?

12. Ethical issues in demand side management

There is another way to average out the impact of investments on prices, the social one: having redistribution between the rich and the poor. It is in fact an old issue, but it is raised in a renewed manner since there has been a decline in municipalism and a development of consumerisation. In Europe, not only was water made cheaper thanks to low interest loans and to subsidies from general budgets, but water tariffs themselves have been adapted: for instance, in Britain, there are no meters for domestic uses, and water used to be paid through rates proportionally to the value of houses. This had redistributive effects, and anybody can check that it had no consequence on water wastage (domestic demand is equivalent to the French, where metering is generalised. In the Netherlands, water supply is metered, but sewerage is kept separate, and paid in local taxes. Sewage treatment is another separate charge, where every family pays as if it was an average family (2.5 or 3 people). Individuals who can prove they are single pay for one. This has a redistributive effect in favour of large families. In France, all potable water volumes sold are subjected to a small tax (water penny), going into a special fund to subsidise the extension of water services to rural areas (the per capita costs of which are supposedly higher). In many local services across Europe, there are schemes to sell initial volumes of water cheaper than the average, so as to help small consumers, etc. etc.

This brings us back to the discussion of universal services, which was initially raised for developing countries: if water is not charged properly, it might be wasted. But if it consumerised, it will be too expensive. Hence the idea of having meters everywhere, but with free or cheap initial allowances. It was officially proposed in the UN Conference on Environment and Development at Rio in 1992: to let people have an initial free allowance of 25 to 40 litres per capita per day (lcd). However, the European experience leads to question the realistic character of this proposal: how does one assess the number of people who really live behind a meter? This information has a cost, and the meter itself must be depreciated and checked by an inspector, and a specific bill has to be issued; all this usually exceeds the equity gain it can provide! If the servicing authority decides a free allowance per meter, and not per capita, it may well end up subsidising the rich by the poor! This paradox has been experienced in some Italian municipalities, and it is now discovered in Belgian Flanders (Van Humbeeck, 2000). Besides, the consumption is largely determined by the equipment in the house, so that it is rather inelastic to price: in the end, some metering is surely needed, for all large users, for owners of swimming pools or hoses

for the gardens, and for grouped 'normal' domestic consumers. But water services are very complex, and cannot be subject to general theoretical economic assumptions. There is a need for social science surveys to understand what people do with drinking water! In practice, what happens in most European countries where water services are still a municipal duty, is that unpaid water bills (which even after the recent important price increases remain a very small percentage (less than 0.5%)), are covered by municipal assistance services to the poor, because it is simpler and cheaper that way.

Now we can develop the whole social acceptability issue in terms of information costs: we have indeed seen that a more rational water services management necessitates a lot of costly information which operators, authorities, and even consumer NGOs do not have. Of course, we can design socio-economic, psycho-sociological and anthropological surveys to better understand what people do with water. But what we mostly need is to 'lower the transaction costs', in this services area just as in the resources area we analysed above. That means building up confidence with users of water services organised in local communities. For instance, if families in a building can trust each other as concerns leaks and wastage control, they can save the cost of individual metering. Similarly, having users' representatives in the policy community, with traditional actors (elected representatives, experts, operators), allows for a collective learning process (both ways) which is the only way to build the most essential factor of sustainability: mutual confidence.

There is a very good example to be given here: consumers are usually convinced that if they adopt water saving attitudes, their water prices should go down. Yet, if this may be true in the long run, it is usually wrong in the short run, since infrastructures are fixed costs industries: many water supplies which have experienced declining water demands have indeed been obliged to raise the unit prices so as to be able to cover their debts! Consumers will only accept that analysis if they are sufficiently informed to have confidence in the service and in the water service community behind. And this may be a reason for keeping local authorities nominally in charge of providing the service, even if they delegate operations to a private company: building confidence on citizen/community rather than on consumer criteria. In a very large city of South America, the French operator of water services is facing difficulties to recover the water bills, and it doesn't get adequate support of the authority (which it would get in Europe). Then the provisional solution found was to sign contracts with the *barrios* (neighbourhoods): the company brings water to the area, and sells it wholesale at cheap price. NGOs in the district then self organise to deliver the water. This helps developing confidence, and has stopped anonymous degradation of infrastructure or meters. Of course, there would be a need for democratic control of this communitarian way of servicing people (to avoid eventual

mafia phenomena on water). But in the services area as in the resources one, the ethical issue is not so much to get rid of communitarian customs for the sake of Statist or Liberal ideals, but to go on relying on them and modernise them to have improved democracy and welfare.

Now there is a last averaging out mechanism to mention: in Europe, in a growing number of cases, public water services begin to interact with other categories of water users. Making this interaction more transparent would allow for interesting positive-sum games. For instance, in France, politicians, the press and NGOs complain about the wide discrepancy between domestic water bills in the country. They even consider developing an averaging out mechanism at national level. But they usually ignore that their water bills partly cover the unpaid toxic pollution discharged by industrial premises in the public sewers, and also diffuse pollution from agriculture (fertilisers and pesticides) which compel water supplies to sophisticate the drinking water production processes. If one could develop contracts between water supplies and other actors, in water communities, water supplies could in many cases 'purchase' the pollution of others rather than sophisticate their water and sewage works. In the Land of Baden-Wurtemberg, for instance, all water users pay a *Wasserpfennig* in their water abstraction charges, and the money raised is used to subsidise farmers who reduce their nitrates use to very low levels. As a result, the Land now has more than 20% of its territory in a sort of global well-head protection area; this increases the autonomy of drinking water supplies, and reduces the need for volumes from costly long distance transfers. Ecologists have taken this contract policy with farmers to court, as implementing what they ironically called the 'polluted-pays principle'. But they have been turned down. It is morally questionable only for those who do not understand that nothing can happen in environmental policies without considerable learning processes, and solidarity and community build up.

13. Conclusion

In all countries, indeed, a balance must be struck between usership and community institutions on the one hand, and general citizenship and State-control on the other: users boards are good places to develop mediation and sharing between qualitatively different uses. But they are neo-corporatist bodies, and as such could be criticised as 'reducing democracy' to usership. Democratically elected regional bodies should play the leading role in water planning, since planning results in possibly unequal treatment of citizens (zoning), and thus requires a strong legitimacy. Police powers on permits and consents should remain with more centralised administrations for the sake of maintaining a broader equity between citizens or industrial premises (equal

opportunity rule). At international level, sovereignty principles associated with modern liberal economies tend to overlook the common property issues: e.g. a State might be tempted to sell raw water to its downstream neighbours. This approach must be balanced in turn by usership and common property approaches: to share water reasonably between users within any river basin, be it international or not. It does not exclude economic compensations, but these are not attached to water as an appropriated good. The result is more flexibility in the bargaining.

Concerning water services, the ethical issue is of course the delivery of sanitation and comfort at an affordable price to all, with altogether best environmental practices. Since many elements are counter-intuitive (among other things, water services are a natural monopoly and a fixed costs industry), it becomes essential to involve the users in the policy network to let them both learn from operators and teach them about their water uses. As long as water services do not cover the entirety of a city or a region, it is usually impossible to rationalise the services and price the service at full cost. Subsidies are then necessary, like they were in developed countries when they were building initial water service infrastructure. There are many possible schemes to lower the costs of investments which are depreciated in a longer time period than is the case for most industries, and at a horizon far beyond the banker's.

At any rate, it should be clear that the democratic management of such a particular common property as water is, does require a complex institutional arrangement. Simple and straightforward solutions designed for the sake of pure economic efficiency, like privatisation of water rights and their transferability, may well end up as unsustainable. If water policies are going anyway to balance the traditional State-liberal coalition in power, with the re-emerging communitarian and subsidiary coalition, we should develop our knowledge of what each of them can bring in a well-designed institutional and administrative set-up, for the improvement of policies.

14. References

- BANTA J., BOSSELMAN and CALLIES. 1973. *The Taking Issue, an Analysis of the Constitutional Limits of Land-Use Control*. Report for the Council on Environmental Quality, Washington D.C.
- BARRAQUÉ, B. 1992. Water Management in Europe: Beyond the Privatisation Debate. In: *Flux*, periodical of the CNRS, GdR 903. Réseaux, Paris, La Documentation Française.
- BARRAQUÉ, B. 1995. *Les politiques de l'eau en Europe*. La Découverte, Coll. Recherches.

- BARRAQUÉ, B. 1997. Europäische Antwort auf John Briscoes Bewertung der deutschen Wasserwirtschaft. In: *gwf Wasser-Abwasser*, 139, No. 6, pp. 360–6.
- BARRAQUÉ, B. 2000. Assessing the Efficiency of Economic Instruments, Reforming the French Agences de l'eau. In: *Market-based Instruments for Environmental Management*, M. S. Andersen, R. U. Sprenger. Edward Elgar.
- BOURJOL, M. 1989. *Les biens communaux*. Décentralisation et développement local. LGDJ, Paris.
- BRISCOE, J. 1996. *The German Model of Water Services Provision, How Well it Works and What it Means for Developing Countries*. World Bank report.
- BURCHI, S. 1991. Current Developments and Trends in the Law and Administration of Water Resources; A Comparative State-of-the-art Appraisal. In: *Journal of Environmental Law*, Vol. 3, No. 1. Oxford University Press.
- CAPONERA, D. A. 1992. *Principles of Water Law and Administration, National and International*. Balkema, Rotterdam.
- CIRIACY WANTRUP, S. V. 1985. *Natural Resources Economics. Selected Papers*, Richard C. Bishop and Stephen O. Andersen (Eds.). , Boulder, Westview Press.
- DA SILVA, J. E., CORREIA, F. N. and CARDOSO DA SILVA, M. 1998. Transboundary Issues in Water Resources. In: *Eurowater, Selected Issues in Water Resources Management in Europe*, F. N. Correia (Dir.). Vol. 2. Balkema, Rotterdam.
- DELLA PENNA, J. 2000. The Customary International Law of the Internationally Shared Fresh Waters. In: *Shared Water Systems and Transboundary issues, with Special Emphasis on the Iberian Peninsula*, Evan Vlachos and F. N. Correia. Luso-American Foundation, Lisbon.
- DU BOIS, F. 1994. Water Rights and the Limits of Environmental Law. In: *Journal of Environmental Law*, Vol. 6, No. 1. Oxford University Press, Oxford.
- GREMION, P. 1976. *Le pouvoir périphérique, bureaucrates et notables dans le système politique français*. Le Seuil.
- HARDIN, G. 1968. The Tragedy of the Commons. In: *Science*, Vol. 162.
- HAWKINS, K. 1984. *Environment and Enforcement. Regulation and the Social Definition of Pollution*. Oxford University Press, Oxford.
- KAHRL, W. 1982. *Water and Power, the Conflict over Los Angeles' Water Supply in the Owens Valley*. University of California Press.
- KRAEMER, A. 1998. Subsidiarity and Water Policy. In: *Eurowater, Selected Issues in Water Resources Management in Europe*, F. N. Correia (Dir.). Vol. 2. Balkema, Rotterdam.
- KNEESE, A. V. and BOWER B. T. 1968. *Managing Water Quality: Economics, Technology, Institutions*. John Hopkins Press, Baltimore.
- KORTE, H. 1990. Die entfaltung der infrastruktur. In: *Sozialgeschichte des Ruhrgebiets im Industrie Zeitalter*, Köllmann W. et al. Patmos Verlag Schwann.

- LASCOUMES, P. 1994. *L'écopouvoir, environnement et politiques*. La Découverte, Paris.
- MEZO, J. 1995. Política del agua: la discusión del Plan Hidrológico Nacional. *Analistas socio-políticos*. Report No. 9a, Madrid.
- MFA. 1998. The Management of Shared River Basins, Experiences from South African Development Community and the European Union. *Focus on Development*, No. 8, May. Dutch Ministry of Foreign Affairs.
- Roy, A. 1999. *Le coût de la vie*, translation in French of *The cost of living*. Gallimard, Paris.
- SANGVAI, S. 1998. *The River and the Life, the People's Struggle in Narmada Valley*, Narmada Bachao Andolan (Ed.).
- SAUNDERS, P. 1983. *The Regional State, a Review of Literature and Agenda for Research*. Sussex University Papers.
- TURTON, A. and SOLOMON, H. (Eds.) 2000. Water Wars: Enduring Myth or Impending Reality. *Africa Dialogue*, Monograph Series No. 2. Accord (African Centre for the Constructive Resolution of Disputes), Mount Edgecombe, Durban.
- VAN HUMBEECK, P. 2000. The Distributive Effects of Water Price Reform on Households in the Flanders Region of Belgium. In: *The Political Economy of Water Pricing Reforms*, A. Dinar (Ed.). IBRD, Oxford University Press. pp. 279–95.
- VERGÉS, J. C. 1996. *Una política económica para el agua*. Círculo de Empresarios, Mundi Prensa.
- VERGÉS, J. C. 2002. *El saqueo del agua en España*. La Tempestad, Barcelona.
- WITTFOGEL, K. 1957. *Oriental Despotism: A Comparative Study of Total Power*. Yale University Press, 1964. *Le despotisme oriental, essai sur les formes totales du pouvoir*, Editions de Minuit, 1964.
- WOLF, A. T. 1998. Conflict and Cooperation along International Waterways. In: *Water Policy*, Vol. 1, pp. 251–65.
- WORSTER, D. 1986. *Rivers of Empire, Water, Aridity, and the Growth of the American West*. Oxford University Press.

15. Additional bibliography

- Andersen M. S. 1994. *Governance by Green Taxes, Making Pollution Prevention Pay*. Manchester University Press.
- Barraqué, B. 1998. Subsidiarité et politique de l'eau. In: *Territoires et subsidiarité, l'action publique locale à la lumière d'un principe controversé*, A. Faure (Ed.). L'Harmattan, Coll. Logiques politiques.
- BRESSERS, H., O'TOOLE, L and RICHARDSON, J. (Eds.). 1995. *Networks for Water Policy, a Comparative Perspective*. Frank Cass, London.

- COASE, R. H. 1960. The problem of Social Cost. In: *Journal of Law and Economics*, Vol. 3, No. 1.
- CORREIA, F. N. (Ed.). 1998. *Eurowater. Selected Issues in Water Resources Management in Europe*. Balkema, Rotterdam, 2 vol.
- DRAIN, M. (Dir.). 1995. Les conflits pour l'eau en Europe méditerranéenne. *Espace rural*, No. 36, January.
- Duran, P. and THOENIG, J.C. 1996. L'Etat et l'action publique territoriale. In: *Revue française de science politique*.
- GAZZANIGA, J.-L. and OURLIAC, J.P. 1979. *Le droit de l'eau*. LITEC.
- GAZZANIGA, J.-L. 1991. Droit de l'eau, le poids de l'histoire. In: *Etudes foncières*, No. 52, September. Association pour le développement des études foncières, Paris.
- GLASBERGEN, P. (Ed.). 1995. *Managing Environmental Disputes, Network Management as an Alternative*. Kluwer Academic Publishers, Dordrecht.
- KRAEMER, R. A. et al. *Comparison of Water Prices in Europe*. Report to the Umweltbundesamt and to the Finance Bundesministerium, Berlin. Published in 1998 for the Drinking Water part, and in 1999 for the Sewerage part.
- LAVELEYE DE, E. 1874. *De la propriété et de ses formes primitives*. Gerber-Ballère, Paris.
- LECOURT, D. 1992. *L'Amérique entre la Bible et Darwin*. PUF, Paris.
- LECOURT, D. 1993. *A quoi sert donc la philosophie ?* PUF, Paris.
- LE GALES, P. (Dir.). 1995. *Les réseaux de politiques publiques*. L'Harmattan.
- LLAMAS, R. 1991. Aspectos generales de las sequías en España y posibles acciones para mitigar sus efectos. In: *Revista de la Real Academia de Ciencias exactas, físicas y naturales*, t. LXXXV, 2 and 3 .
- LLAMAS, R. 1996. Tópicos y manipulaciones en torno a la política del agua. In: *Ecosistemas*, No. 16.
- MALUQUER DE MOTES, J. 1983. La despatrimonialización del agua, movilización de un recurso natural fundamental. In: *Revista de historia económica*, Año 1, No. 2.
- MARCOU, G. 1993. Principe de subsidiarité, constitution française et décentralisation. In: *Entre l'Europe et la décentralisation*, J. C. Némery and S. Wachter (Dir.). DATAR/ Editions de l'Aube.
- MARTIN, Y. 1988. Quelques réflexions sur l'évolution des agences de l'eau. In: *Annales des mines*, July-August.
- MILLON-DELSOL, C. 1993. *Le principe de subsidiarité*. Coll. Que sais-je? PUF, Paris.
- OSTROM, E. 1990. *Governing the Commons, the Evolution of Institutions for Collective Action*. Cambridge University Press.
- PARKER, D. J. and PENNING-ROWSELL, E. C. 1980. *Water Planning in Britain*. Allen and Unwin.
- PEARCE, F. 1982. *Water Shed, the Water Crisis in Britain*. Junction Books.

- Rees, Y. et al. 1996. *International Comparison of the Demand for Water*. Water Research Centre report to the OFWAT.
- RICHARDSON, J. J. and MALONEY, R. 1992. The Dynamics of Policy Change: Lobbying and Water Privatization. In: *Public administration*, Vol. 70, No. 2.
- SIRONNEAU, J. 1992. La nouvelle loi sur l'eau ou la recherche d'une gestion équilibrée. In: *Revue juridique de l'environnement*, 2.
- WEBER, J. and REVERET, J. P. 1993. Biens communs, les leures de la privatisation. In: *Une terre en renaissance*. Le Monde diplomatique, Coll. Savoirs.